

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.

TestAmerica St. Louis

13715 Rider Trail North

Earth City, MO 63045

Tel: (314)298-8566

TestAmerica Job ID: 160-18646-1

Client Project/Site: ORNL Y-12 Outfall 200 Characterization

For:

Alliant Corporation

320 N Cedar Bluff Road

Suite 200

Knoxville, Tennessee 37923

Attn: Doug Milloway

Authorized for release by:

10/4/2016 7:06:22 PM

Erika Gish, Project Manager II

(314)298-8566

erika.gish@testamericainc.com

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This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Case Narrative

Client: Alliant Corporation

Project/Site: ORNL Y-12 Outfall 200 Characterization

TestAmerica Job ID: 160-18646-1

Job ID: 160-18646-1

Laboratory: TestAmerica St. Louis

Narrative

CASE NARRATIVE

Client: Alliant Corporation

Project: ORNL Y-12 Outfall 200 Characterization

Report Number: 160-18646-1

With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In some cases, due to interference or analytes present at high concentrations, samples were diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

TestAmerica St. Louis attests to the validity of the laboratory data generated by TestAmerica facilities reported herein. All analyses performed by TestAmerica facilities were done using established laboratory SOPs that incorporate QA/QC procedures described in the application methods. TestAmerica's operations groups have reviewed the data for compliance with the laboratory QA/QC plan, and data have been found to be compliant with laboratory protocols unless otherwise noted below.

The test results in this report meet all NELAP requirements for parameters for which accreditation is required or available. Any exceptions to NELAP requirements are noted in this report. Pursuant to NELAP, this report may not be reproduced, except in full, without the written approval of the laboratory.

Calculations are performed before rounding to avoid round-off errors in calculated results.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

All solid sample results for Chemistry analyses are reported on an "as received" basis unless otherwise indicated by the presence of a % solids value in the method header. All soil/sediment sample results for radiochemistry analyses are based upon sample as dried and disaggregated with the exception of tritium, carbon-14, and iodine-129 by gamma spectroscopy unless requested as wet weight by the client."

This laboratory report is confidential and is intended for the sole use of TestAmerica and its client.

RECEIPT

The samples were received on 8/16/2016 9:20 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 0.4° C.

Comments

Please see attached subcontract report for analyses at TestAmerica Richland.

POLYCHLORINATED BIPHENYLS (PCBs)

Samples YMTFA72C (160-18646-1), YMTFA65C (160-18646-2), YMTFA58C (160-18646-3), YMTFA57C (160-18646-4), YMTFA56C (160-18646-5) and YMTFA55C (160-18646-6) were analyzed for Polychlorinated biphenyls (PCBs) with multi-incremental preparation in accordance with 8082A. The samples were dried on 08/17/2016, prepared on 08/24/2016 and analyzed on 08/26/2016 and 09/02/2016.

Analytical Batch 160-266473

EPA Method 8082/8082A requires a minimum of 3 peaks to be used for PCB quantitation. Due to the presence of multiple aroclors in the following samples, less than 5 peaks were used for quantitation.YMTFA65C (160-18646-2)

Case Narrative

Client: Alliant Corporation

Project/Site: ORNL Y-12 Outfall 200 Characterization

TestAmerica Job ID: 160-18646-1

Job ID: 160-18646-1 (Continued)

Laboratory: TestAmerica St. Louis (Continued)

The CCV recoveries for Aroclor 1260 and DCB are outside the lower QC limits on the secondary column, but within acceptable QC limits on the primary column. There were no hits above the RL for Aroclor 1260 and the surrogate recoveries in the samples were within acceptable QC limits on the primary column; therefore confirmation is not needed. (CCV 160-266473/27) and (CCV 160-266473/39)

The internal standard eluted outside the retention time window for the following CCV: (CCVIS 160-266473/3). This retention time shift was taken into account when reviewing the sample(s) for target compounds.

Analytical Batch 160-267639

The following samples required a copper clean-up to reduce matrix interferences caused by sulfur: YMTFA72C (160-18646-1), (LCS 160-266347/2-A) and (MB 160-266347/1-A).

The internal standard eluted outside the retention time window for the following samples: (CCV 160-267639/49), (CCV 160-267639/50) and (ICV 160-267639/14). This retention time shift was taken into account when reviewing the samples for target compounds.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

TCLP METALS (ICP)

Samples YMTFA72C (160-18646-1), YMTFA65C (160-18646-2), YMTFA58C (160-18646-3), YMTFA57C (160-18646-4), YMTFA56C (160-18646-5) and YMTFA55C (160-18646-6) were analyzed for Metals (ICP) in accordance with SW-846 Method 1311/6010C. The samples were leached on 08/17/2016, prepared on 08/24/2016 and analyzed on 08/29/2016.

The following samples were diluted due to the nature of the sample matrix. Samples are high in salts: YMTFA72C (160-18646-1), YMTFA65C (160-18646-2), YMTFA58C (160-18646-3), YMTFA57C (160-18646-4), YMTFA56C (160-18646-5), YMTFA55C (160-18646-6), (160-18646-A-1-H MS ^), (160-18646-A-1-I MSD) and (160-18646-A-1-G SD ^). Elevated reporting limits (RLs) are provided.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

TCLP MERCURY (CVAA)

Samples YMTFA72C (160-18646-1), YMTFA65C (160-18646-2), YMTFA58C (160-18646-3), YMTFA57C (160-18646-4), YMTFA56C (160-18646-5) and YMTFA55C (160-18646-6) were analyzed for Mercury (CVAA) in accordance with SW-846 Method 1311/7470A. The samples were leached on 08/17/2016, prepared on 08/25/2016 and analyzed on 08/26/2016.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

TRITIUM

Samples YMTFA72C (160-18646-1), YMTFA65C (160-18646-2), YMTFA58C (160-18646-3), YMTFA57C (160-18646-4), YMTFA56C (160-18646-5) and YMTFA55C (160-18646-6) were analyzed for Tritium in accordance with DOE. The samples were prepared on 08/29/2016 and analyzed on 09/07/2016.

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

RADIUM-226 BY ALPHA SPECTROMETRY

Samples YMTFA72C (160-18646-1), YMTFA65C (160-18646-2), YMTFA58C (160-18646-3), YMTFA57C (160-18646-4), YMTFA56C (160-18646-5) and YMTFA55C (160-18646-6) were analyzed for Radium-226 by Alpha Spectrometry in accordance with ST-RC-0301. The samples were dried on 08/17/2016, prepared on 09/15/2016 and analyzed on 09/24/2016.

The following samples could not be thoroughly homogenized before sub-sampling was performed due to sample matrix: YMTFA72C (160-18646-1), YMTFA65C (160-18646-2), YMTFA58C (160-18646-3), YMTFA57C (160-18646-4), YMTFA56C (160-18646-5), YMTFA55C (160-18646-6) and (160-18646-A-5-A DU). The samples had small rocks and were of varying colors.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

TOTAL BETA STRONTIUM (GFPC)

Samples YMTFA72C (160-18646-1), YMTFA65C (160-18646-2), YMTFA58C (160-18646-3), YMTFA57C (160-18646-4), YMTFA56C

Case Narrative

Client: Alliant Corporation

Project/Site: ORNL Y-12 Outfall 200 Characterization

TestAmerica Job ID: 160-18646-1

Job ID: 160-18646-1 (Continued)

Laboratory: TestAmerica St. Louis (Continued)

(160-18646-5) and YMTFA55C (160-18646-6) were analyzed for Total Beta Strontium (GFPC) in accordance with SR-03-RC. The samples were dried on 08/17/2016, prepared on 08/25/2016 and analyzed on 08/31/2016.

The following samples have strontium carrier recoveries above the 110% QC limit due to matrix interferences; (160-18646-A-1-M; 120%, and 160-18646-A-2-I; 113%). The LCS (laboratory control sample) has an acceptable spike recovery demonstrating acceptable sample preparation and instrument performance. The samples have been truncated to 100% to reduce any potential bias a high carrier recovery may have. The data have been qualified and reported.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

TECHNETIUM-99 (LSC)

Samples YMTFA72C (160-18646-1), YMTFA65C (160-18646-2), YMTFA58C (160-18646-3), YMTFA57C (160-18646-4), YMTFA56C (160-18646-5) and YMTFA55C (160-18646-6) were analyzed for Technetium-99 (LSC) in accordance with TC_02_RC. The samples were prepared on 08/23/2016 and analyzed on 08/27/2016.

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

TestAmerica

THE LABORATORY FOR CHILD LANGUAGE STUDY

Login Sample Receipt Checklist

Client: Alliant Corporation

Job Number: 160-18646-1

Login Number: 18646

List Number: 1

Creator: Daniels, Brian J

List Source: TestAmerica St. Louis

Question

Answer

Comment

Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Definitions/Glossary

Client: Alliant Corporation

Project/Site: ORNL Y-12 Outfall 200 Characterization

TestAmerica Job ID: 160-18646-1

Qualifiers

GC Semi VOA

Qualifier	Qualifier Description
U	Undetected at the Limit of Detection.
J	Estimated: The analyte was positively identified; the quantitation is an estimation
J	Estimated: The quantitation is an estimation due to discrepancies in meeting certain analyte-specific quality control criteria.

Metals

Qualifier	Qualifier Description
U	Undetected at the Limit of Detection.
J	Estimated: The analyte was positively identified; the quantitation is an estimation

Rad

Qualifier	Qualifier Description
U	Undetected at the Limit of Detection.
S	Carrier is outside acceptance limits.

Glossary

Abbreviation

These commonly used abbreviations may or may not be present in this report.

□	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative error ratio
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

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Method Summary

Client: Alliant Corporation

Project/Site: ORNL Y-12 Outfall 200 Characterization

TestAmerica Job ID: 160-18646-1

Method	Method Description	Protocol	Laboratory
8082A	Polychlorinated Biphenyls (PCBs) by Gas Chromatography	SW846	TAL SL
6010C	TCLP Metals (ICP)	SW846	TAL SL
7470A	TCLP Mercury	SW846	TAL SL
H3-04-RC	Tritium (LSC)	DOE	TAL SL
SR-03-RC	Total Beta Strontium (GFPC)	DOE	TAL SL
ST-RC-0301	Radium-226 (Alpha Spectrometry)	TAL-STL	TAL SL
TC-02-RC	Technetium-99 (LSC)	DOE	TAL SL
Am-241	General Sub Contract Method	NONE	TAL RCH
C-14	General Sub Contract Method	NONE	TAL RCH
Np-237	General Sub Contract Method	NONE	TAL RCH
Pu-238,	General Sub Contract Method	NONE	TAL RCH
Pu-239/240			
Th-228, Th-230,	General Sub Contract Method	NONE	TAL RCH
Th-232			
U-233/234,	General Sub Contract Method	NONE	TAL RCH
U-235/236, U-238			

Protocol References:

DOE = U.S. Department of Energy

NONE = NONE

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

TAL-STL = TestAmerica Laboratories, St. Louis, Facility Standard Operating Procedure.

Laboratory References:

TAL RCH = TestAmerica Richland, 2800 George Washington Way, Richland, WA 99352, TEL (509)375-3131

TAL SL = TestAmerica St. Louis, 13715 Rider Trail North, Earth City, MO 63045, TEL (314)298-8566

Sample Summary

Client: Alliant Corporation

Project/Site: ORNL Y-12 Outfall 200 Characterization

TestAmerica Job ID: 160-18646-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
160-18646-1	YMTFA72C	Solid	08/15/16 15:05	08/16/16 09:20
160-18646-2	YMTFA65C	Solid	08/15/16 14:55	08/16/16 09:20
160-18646-3	YMTFA58C	Solid	08/15/16 14:23	08/16/16 09:20
160-18646-4	YMTFA57C	Solid	08/15/16 14:28	08/16/16 09:20
160-18646-5	YMTFA56C	Solid	08/15/16 14:38	08/16/16 09:20
160-18646-6	YMTFA55C	Solid	08/15/16 14:45	08/16/16 09:20

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TestAmerica St. Louis

Detection Summary

Client: Alliant Corporation

Project/Site: ORNL Y-12 Outfall 200 Characterization

TestAmerica Job ID: 160-18646-1

Client Sample ID: YMTFA72C

Lab Sample ID: 160-18646-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Barium	0.57	J	0.63	0.19	mg/L	5		6010C	Total/NA

Client Sample ID: YMTFA65C

Lab Sample ID: 160-18646-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
PCB-1016	0.022	J	0.033	0.0095	mg/Kg	1		8082A	Total/NA
PCB-1260	0.012	J	0.033	0.0079	mg/Kg	1		8082A	Total/NA
Polychlorinated biphenyls, Total	0.034		0.033	0.0079	mg/Kg	1		8082A	Total/NA
Barium	0.52	J	0.63	0.19	mg/L	5		6010C	Total/NA

Client Sample ID: YMTFA58C

Lab Sample ID: 160-18646-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Barium	0.45	J	0.63	0.19	mg/L	5		6010C	Total/NA

Client Sample ID: YMTFA57C

Lab Sample ID: 160-18646-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Barium	0.25	J	0.63	0.19	mg/L	5		6010C	Total/NA

Client Sample ID: YMTFA56C

Lab Sample ID: 160-18646-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
PCB-1260	0.027	J	0.033	0.0080	mg/Kg	1		8082A	Total/NA
Polychlorinated biphenyls, Total	0.027	J	0.033	0.0080	mg/Kg	1		8082A	Total/NA
Barium	0.33	J	0.63	0.19	mg/L	5		6010C	Total/NA

Client Sample ID: YMTFA55C

Lab Sample ID: 160-18646-6

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
PCB-1260	0.0096	J	0.033	0.0080	mg/Kg	1		8082A	Total/NA
Polychlorinated biphenyls, Total	0.0096	J	0.033	0.0080	mg/Kg	1		8082A	Total/NA
Barium	0.34	J	0.63	0.19	mg/L	5		6010C	Total/NA

This Detection Summary does not include radiochemical test results.

TestAmerica St. Louis

Client Sample Results

Client: Alliant Corporation

Project/Site: ORNL Y-12 Outfall 200 Characterization

TestAmerica Job ID: 160-18646-1

Client Sample ID: YMTFA72C

Lab Sample ID: 160-18646-1

Matrix: Solid

Date Collected: 08/15/16 15:05

Date Received: 08/16/16 09:20

Method: 8082A - Polychlorinated Biphenyls (PCBs) by Gas Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
PCB-1016	0.0096	U	0.033	0.0096	mg/Kg		08/24/16 10:11	09/02/16 09:06	1
PCB-1221	0.0096	U	0.033	0.0096	mg/Kg		08/24/16 10:11	09/02/16 09:06	1
PCB-1232	0.0096	U	0.033	0.0096	mg/Kg		08/24/16 10:11	09/02/16 09:06	1
PCB-1242	0.0096	U	0.033	0.0096	mg/Kg		08/24/16 10:11	09/02/16 09:06	1
PCB-1248	0.0096	U	0.033	0.0096	mg/Kg		08/24/16 10:11	09/02/16 09:06	1
PCB-1254	0.0080	U	0.033	0.0080	mg/Kg		08/24/16 10:11	09/02/16 09:06	1
PCB-1260	0.0080	U	0.033	0.0080	mg/Kg		08/24/16 10:11	09/02/16 09:06	1
PCB-1262	0.0080	U	0.033	0.0080	mg/Kg		08/24/16 10:11	09/02/16 09:06	1
PCB-1268	0.0080	U	0.033	0.0080	mg/Kg		08/24/16 10:11	09/02/16 09:06	1
Polychlorinated biphenyls, Total	0.0080	U	0.033	0.0080	mg/Kg		08/24/16 10:11	09/02/16 09:06	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
DCB Decachlorobiphenyl (Surr)	86		23 - 146				08/24/16 10:11	09/02/16 09:06	1

Method: 6010C - TCLP Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	0.050	U	0.13	0.050	mg/L		08/24/16 16:46	08/29/16 18:10	5
Barium	0.57	J	0.63	0.19	mg/L		08/24/16 16:46	08/29/16 18:10	5
Cadmium	0.019	U	0.063	0.019	mg/L		08/24/16 16:46	08/29/16 18:10	5
Chromium	0.038	U	0.13	0.038	mg/L		08/24/16 16:46	08/29/16 18:10	5
Lead	0.038	U	0.13	0.038	mg/L		08/24/16 16:46	08/29/16 18:10	5
Selenium	0.063	U	0.19	0.063	mg/L		08/24/16 16:46	08/29/16 18:10	5
Silver	0.038	U	0.13	0.038	mg/L		08/24/16 16:46	08/29/16 18:10	5

Method: 7470A - TCLP Mercury

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.000079	U	0.0010	0.000079	mg/L		08/25/16 17:09	08/26/16 09:29	1

Method: H3-04-RC - Tritium (LSC)

Analyte	Result	Qualifier	Count	Total	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
			(2σ+/-)	(2σ+/-)						
Tritium	0.00840	U	0.216	0.216	1.00	0.384	pCi/g	08/29/16 11:14	09/07/16 19:16	1

Method: SR-03-RC - Total Beta Strontium (GFPC)

Analyte	Result	Qualifier	Count	Total	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
			(2σ+/-)	(2σ+/-)						
Strontium 89/90	0.240		0.109	0.110	3.00	0.154	pCi/g	08/25/16 18:10	08/31/16 07:19	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Sr Carrier	120	S	40 - 110					08/25/16 18:10	08/31/16 07:19	1

Method: ST-RC-0301 - Radium-226 (Alpha Spectrometry)

Analyte	Result	Qualifier	Count	Total	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
			(2σ+/-)	(2σ+/-)						
Radium-226	0.402		0.102	0.107	1.00	0.0194	pCi/g	09/15/16 18:53	09/24/16 16:27	1
Tracer	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
At-217	60.2		30 - 110					09/15/16 18:53	09/24/16 16:27	1

TestAmerica St. Louis

Client Sample Results

Client: Alliant Corporation

Project/Site: ORNL Y-12 Outfall 200 Characterization

TestAmerica Job ID: 160-18646-1

Client Sample ID: YMTFA72C

Date Collected: 08/15/16 15:05

Date Received: 08/16/16 09:20

Lab Sample ID: 160-18646-1

Matrix: Solid

Method: TC-02-RC - Technetium-99 (LSC)

Analyte	Result	Qualifier	Count	Total	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
			Uncert. (2σ+/-)	Uncert. (2σ+/-)						
Technetium-99	0.0945	U	0.228	0.228	1.00	0.383	pCi/g	08/23/16 10:56	08/27/16 03:31	1
Tracer	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Tc-99m	98.5		30 - 110					08/23/16 10:56	08/27/16 03:31	1

Client Sample ID: YMTFA65C

Date Collected: 08/15/16 14:55

Date Received: 08/16/16 09:20

Lab Sample ID: 160-18646-2

Matrix: Solid

Method: 8082A - Polychlorinated Biphenyls (PCBs) by Gas Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
							Prepared	Analyzed	Dil Fac
PCB-1016	0.022	J	0.033	0.0095	mg/Kg		08/24/16 10:11	08/26/16 04:05	1
PCB-1221	0.0095	U	0.033	0.0095	mg/Kg		08/24/16 10:11	08/26/16 04:05	1
PCB-1232	0.0095	U	0.033	0.0095	mg/Kg		08/24/16 10:11	08/26/16 04:05	1
PCB-1242	0.0095	U	0.033	0.0095	mg/Kg		08/24/16 10:11	08/26/16 04:05	1
PCB-1248	0.0095	U	0.033	0.0095	mg/Kg		08/24/16 10:11	08/26/16 04:05	1
PCB-1254	0.0079	U	0.033	0.0079	mg/Kg		08/24/16 10:11	08/26/16 04:05	1
PCB-1260	0.012	J	0.033	0.0079	mg/Kg		08/24/16 10:11	08/26/16 04:05	1
PCB-1262	0.0079	U	0.033	0.0079	mg/Kg		08/24/16 10:11	08/26/16 04:05	1
PCB-1268	0.0079	U	0.033	0.0079	mg/Kg		08/24/16 10:11	08/26/16 04:05	1
Polychlorinated biphenyls, Total	0.034		0.033	0.0079	mg/Kg		08/24/16 10:11	08/26/16 04:05	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
DCB Decachlorobiphenyl (Surr)	95		23 - 146				08/24/16 10:11	08/26/16 04:05	1

Method: 6010C - TCLP Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
							Prepared	Analyzed	Dil Fac
Arsenic	0.050	U	0.13	0.050	mg/L		08/24/16 16:46	08/29/16 18:28	5
Barium	0.52	J	0.63	0.19	mg/L		08/24/16 16:46	08/29/16 18:28	5
Cadmium	0.019	U	0.063	0.019	mg/L		08/24/16 16:46	08/29/16 18:28	5
Chromium	0.038	U	0.13	0.038	mg/L		08/24/16 16:46	08/29/16 18:28	5
Lead	0.038	U	0.13	0.038	mg/L		08/24/16 16:46	08/29/16 18:28	5
Selenium	0.063	U	0.19	0.063	mg/L		08/24/16 16:46	08/29/16 18:28	5
Silver	0.038	U	0.13	0.038	mg/L		08/24/16 16:46	08/29/16 18:28	5

Method: 7470A - TCLP Mercury

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
							Prepared	Analyzed	Dil Fac
Mercury	0.000079	U	0.0010	0.000079	mg/L		08/25/16 17:09	08/26/16 09:38	1

Method: H3-04-RC - Tritium (LSC)

Analyte	Result	Qualifier	Count	Total	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
			Uncert. (2σ+/-)	Uncert. (2σ+/-)						
Tritium	-0.157	U	0.194	0.195	1.00	0.370	pCi/g	08/29/16 11:14	09/07/16 20:01	1

TestAmerica St. Louis

Client Sample Results

Client: Alliant Corporation

TestAmerica Job ID: 160-18646-1

Project/Site: ORNL Y-12 Outfall 200 Characterization

Client Sample ID: YMTFA65C

Lab Sample ID: 160-18646-2

Date Collected: 08/15/16 14:55

Matrix: Solid

Date Received: 08/16/16 09:20

Method: SR-03-RC - Total Beta Strontium (GFPC)

Analyte	Result	Qualifier	Count	Total	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
			Uncert.	(2σ+/-)						
Strontium 89/90	0.162		0.0985	0.0992	3.00	0.148	pCi/g	08/25/16 18:10	08/31/16 07:19	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Sr Carrier	113	S	40 - 110					08/25/16 18:10	08/31/16 07:19	1

Method: ST-RC-0301 - Radium-226 (Alpha Spectrometry)

Analyte	Result	Qualifier	Count	Total	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
			Uncert.	(2σ+/-)						
Radium-226	0.392		0.0984	0.104	1.00	0.0628	pCi/g	09/15/16 18:53	09/24/16 16:27	1
Tracer	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
At-217	67.4		30 - 110					09/15/16 18:53	09/24/16 16:27	1

Method: TC-02-RC - Technetium-99 (LSC)

Analyte	Result	Qualifier	Count	Total	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
			Uncert.	(2σ+/-)						
Technetium-99	0.147	U	0.251	0.251	1.00	0.418	pCi/g	08/23/16 10:56	08/27/16 04:02	1
Tracer	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Tc-99m	90.1		30 - 110					08/23/16 10:56	08/27/16 04:02	1

Client Sample ID: YMTFA58C

Lab Sample ID: 160-18646-3

Date Collected: 08/15/16 14:23

Matrix: Solid

Date Received: 08/16/16 09:20

Method: 8082A - Polychlorinated Biphenyls (PCBs) by Gas Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
			Count	Total					
PCB-1016	0.0096	U	0.033	0.0096	mg/Kg	D	08/24/16 10:11	08/26/16 04:28	1
PCB-1221	0.0096	U	0.033	0.0096	mg/Kg		08/24/16 10:11	08/26/16 04:28	1
PCB-1232	0.0096	U	0.033	0.0096	mg/Kg		08/24/16 10:11	08/26/16 04:28	1
PCB-1242	0.0096	U	0.033	0.0096	mg/Kg		08/24/16 10:11	08/26/16 04:28	1
PCB-1248	0.0096	U	0.033	0.0096	mg/Kg		08/24/16 10:11	08/26/16 04:28	1
PCB-1254	0.0080	U	0.033	0.0080	mg/Kg		08/24/16 10:11	08/26/16 04:28	1
PCB-1260	0.0080	U	0.033	0.0080	mg/Kg		08/24/16 10:11	08/26/16 04:28	1
PCB-1262	0.0080	U	0.033	0.0080	mg/Kg		08/24/16 10:11	08/26/16 04:28	1
PCB-1268	0.0080	U	0.033	0.0080	mg/Kg		08/24/16 10:11	08/26/16 04:28	1
Polychlorinated biphenyls, Total	0.0080	U	0.033	0.0080	mg/Kg		08/24/16 10:11	08/26/16 04:28	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
DCB Decachlorobiphenyl (Surr)	73		23 - 146				08/24/16 10:11	08/26/16 04:28	1

Method: 6010C - TCLP Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
			Count	Total					
Arsenic	0.050	U	0.13	0.050	mg/L	D	08/24/16 16:46	08/29/16 18:33	5
Barium	0.45	J	0.63	0.19	mg/L		08/24/16 16:46	08/29/16 18:33	5
Cadmium	0.019	U	0.063	0.019	mg/L		08/24/16 16:46	08/29/16 18:33	5
Chromium	0.038	U	0.13	0.038	mg/L		08/24/16 16:46	08/29/16 18:33	5

TestAmerica St. Louis

Client Sample Results

Client: Alliant Corporation

Project/Site: ORNL Y-12 Outfall 200 Characterization

TestAmerica Job ID: 160-18646-1

Client Sample ID: YMTFA58C

Date Collected: 08/15/16 14:23

Date Received: 08/16/16 09:20

Lab Sample ID: 160-18646-3

Matrix: Solid

Method: 6010C - TCLP Metals (ICP) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Lead	0.038	U	0.13	0.038	mg/L		08/24/16 16:46	08/29/16 18:33	5
Selenium	0.063	U	0.19	0.063	mg/L		08/24/16 16:46	08/29/16 18:33	5
Silver	0.038	U	0.13	0.038	mg/L		08/24/16 16:46	08/29/16 18:33	5

Method: 7470A - TCLP Mercury

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.000079	U	0.0010	0.000079	mg/L		08/25/16 17:09	08/26/16 09:41	1

Method: H3-04-RC - Tritium (LSC)

Analyte	Result	Qualifier	Count	Total	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
			Uncert. (2σ+/-)	Uncert. (2σ+/-)						
Tritium	-0.0655	U	0.208	0.208	1.00	0.382	pCi/g	08/29/16 11:14	09/07/16 20:24	1

Method: SR-03-RC - Total Beta Strontium (GFPC)

Analyte	Result	Qualifier	Count	Total	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
			Uncert. (2σ+/-)	Uncert. (2σ+/-)						
Strontium 89/90	-0.0429	U	0.129	0.129	3.00	0.238	pCi/g	08/25/16 18:10	08/31/16 07:19	1
<i>Carrier</i>										
Sr Carrier	74.2		40 - 110					08/25/16 18:10	08/31/16 07:19	1

Method: ST-RC-0301 - Radium-226 (Alpha Spectrometry)

Analyte	Result	Qualifier	Count	Total	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
			Uncert. (2σ+/-)	Uncert. (2σ+/-)						
Radium-226	0.411		0.0902	0.0966	1.00	0.0149	pCi/g	09/15/16 18:53	09/24/16 16:27	1
<i>Tracer</i>										
At-217	71.2		30 - 110					09/15/16 18:53	09/24/16 16:27	1

Method: TC-02-RC - Technetium-99 (LSC)

Analyte	Result	Qualifier	Count	Total	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
			Uncert. (2σ+/-)	Uncert. (2σ+/-)						
Technetium-99	0.0804	U	0.228	0.229	1.00	0.386	pCi/g	08/23/16 10:56	08/27/16 04:33	1
<i>Tracer</i>										
Tc-99m	99.0		30 - 110					08/23/16 10:56	08/27/16 04:33	1

Client Sample ID: YMTFA57C

Date Collected: 08/15/16 14:28

Date Received: 08/16/16 09:20

Lab Sample ID: 160-18646-4

Matrix: Solid

Method: 8082A - Polychlorinated Biphenyls (PCBs) by Gas Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
PCB-1016	0.0096	U	0.033	0.0096	mg/Kg		08/24/16 10:11	08/26/16 04:50	1
PCB-1221	0.0096	U	0.033	0.0096	mg/Kg		08/24/16 10:11	08/26/16 04:50	1
PCB-1232	0.0096	U	0.033	0.0096	mg/Kg		08/24/16 10:11	08/26/16 04:50	1
PCB-1242	0.0096	U	0.033	0.0096	mg/Kg		08/24/16 10:11	08/26/16 04:50	1
PCB-1248	0.0096	U	0.033	0.0096	mg/Kg		08/24/16 10:11	08/26/16 04:50	1

TestAmerica St. Louis

Client Sample Results

Client: Alliant Corporation

Project/Site: ORNL Y-12 Outfall 200 Characterization

TestAmerica Job ID: 160-18646-1

Client Sample ID: YMTFA57C

Lab Sample ID: 160-18646-4

Date Collected: 08/15/16 14:28

Matrix: Solid

Date Received: 08/16/16 09:20

Method: 8082A - Polychlorinated Biphenyls (PCBs) by Gas Chromatography (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
PCB-1254	0.0080	U	0.033	0.0080	mg/Kg		08/24/16 10:11	08/26/16 04:50	1
PCB-1260	0.0080	U	0.033	0.0080	mg/Kg		08/24/16 10:11	08/26/16 04:50	1
PCB-1262	0.0080	U	0.033	0.0080	mg/Kg		08/24/16 10:11	08/26/16 04:50	1
PCB-1268	0.0080	U	0.033	0.0080	mg/Kg		08/24/16 10:11	08/26/16 04:50	1
Polychlorinated biphenyls, Total	0.0080	U	0.033	0.0080	mg/Kg		08/24/16 10:11	08/26/16 04:50	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
DCB Decachlorobiphenyl (Surr)	77		23 - 146	08/24/16 10:11	08/26/16 04:50	1

Method: 6010C - TCLP Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	0.050	U	0.13	0.050	mg/L		08/24/16 16:46	08/29/16 18:38	5
Barium	0.25	J	0.63	0.19	mg/L		08/24/16 16:46	08/29/16 18:38	5
Cadmium	0.019	U	0.063	0.019	mg/L		08/24/16 16:46	08/29/16 18:38	5
Chromium	0.038	U	0.13	0.038	mg/L		08/24/16 16:46	08/29/16 18:38	5
Lead	0.038	U	0.13	0.038	mg/L		08/24/16 16:46	08/29/16 18:38	5
Selenium	0.063	U	0.19	0.063	mg/L		08/24/16 16:46	08/29/16 18:38	5
Silver	0.038	U	0.13	0.038	mg/L		08/24/16 16:46	08/29/16 18:38	5

Method: 7470A - TCLP Mercury

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.000079	U	0.0010	0.000079	mg/L		08/25/16 17:09	08/26/16 09:43	1

Method: H3-04-RC - Tritium (LSC)

Analyte	Result	Qualifier	Count	Total	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
			Uncert. (2σ+/-)	Uncert. (2σ+/-)						
Tritium	-0.167	U	0.198	0.198	1.00	0.381	pCi/g	08/29/16 11:14	09/07/16 21:10	1

Method: SR-03-RC - Total Beta Strontium (GFPC)

Analyte	Result	Qualifier	Count	Total	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
			Uncert. (2σ+/-)	Uncert. (2σ+/-)						
Strontium 89/90	0.129	U	0.121	0.122	3.00	0.196	pCi/g	08/25/16 18:10	08/31/16 07:20	1

Carrier	%Yield	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Sr Carrier	82.1		40 - 110	08/25/16 18:10	08/31/16 07:20	1

Method: ST-RC-0301 - Radium-226 (Alpha Spectrometry)

Analyte	Result	Qualifier	Count	Total	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
			Uncert. (2σ+/-)	Uncert. (2σ+/-)						
Radium-226	0.469		0.105	0.112	1.00	0.0535	pCi/g	09/15/16 18:53	09/24/16 16:27	1

Tracer	%Yield	Qualifier	Limits	Prepared	Analyzed	Dil Fac
At-217	65.8		30 - 110	09/15/16 18:53	09/24/16 16:27	1

Method: TC-02-RC - Technetium-99 (LSC)

Analyte	Result	Qualifier	Count	Total	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
			Uncert. (2σ+/-)	Uncert. (2σ+/-)						
Technetium-99	0.0287	U	0.250	0.250	1.00	0.426	pCi/g	08/23/16 10:56	08/27/16 05:04	1

TestAmerica St. Louis

Client Sample Results

Client: Alliant Corporation

Project/Site: ORNL Y-12 Outfall 200 Characterization

TestAmerica Job ID: 160-18646-1

Tracer	%Yield	Qualifier	Limits
Tc-99m	88.9		30 - 110

Prepared	Analyzed	Dil Fac
08/23/16 10:56	08/27/16 05:04	1

Client Sample ID: YMTFA56C

Date Collected: 08/15/16 14:38

Date Received: 08/16/16 09:20

Lab Sample ID: 160-18646-5

Matrix: Solid

Method: 8082A - Polychlorinated Biphenyls (PCBs) by Gas Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
PCB-1016	0.0096	U	0.033	0.0096	mg/Kg		08/24/16 10:11	08/26/16 05:13	1
PCB-1221	0.0096	U	0.033	0.0096	mg/Kg		08/24/16 10:11	08/26/16 05:13	1
PCB-1232	0.0096	U	0.033	0.0096	mg/Kg		08/24/16 10:11	08/26/16 05:13	1
PCB-1242	0.0096	U	0.033	0.0096	mg/Kg		08/24/16 10:11	08/26/16 05:13	1
PCB-1248	0.0096	U	0.033	0.0096	mg/Kg		08/24/16 10:11	08/26/16 05:13	1
PCB-1254	0.0080	U	0.033	0.0080	mg/Kg		08/24/16 10:11	08/26/16 05:13	1
PCB-1260	0.027	J	0.033	0.0080	mg/Kg		08/24/16 10:11	08/26/16 05:13	1
PCB-1262	0.0080	U	0.033	0.0080	mg/Kg		08/24/16 10:11	08/26/16 05:13	1
PCB-1268	0.0080	U	0.033	0.0080	mg/Kg		08/24/16 10:11	08/26/16 05:13	1
Polychlorinated biphenyls, Total	0.027	J	0.033	0.0080	mg/Kg		08/24/16 10:11	08/26/16 05:13	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
DCB Decachlorobiphenyl (Surr)	75		23 - 146	08/24/16 10:11	08/26/16 05:13	1

Method: 6010C - TCLP Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	0.050	U	0.13	0.050	mg/L		08/24/16 16:46	08/29/16 18:56	5
Barium	0.33	J	0.63	0.19	mg/L		08/24/16 16:46	08/29/16 18:56	5
Cadmium	0.019	U	0.063	0.019	mg/L		08/24/16 16:46	08/29/16 18:56	5
Chromium	0.038	U	0.13	0.038	mg/L		08/24/16 16:46	08/29/16 18:56	5
Lead	0.038	U	0.13	0.038	mg/L		08/24/16 16:46	08/29/16 18:56	5
Selenium	0.063	U	0.19	0.063	mg/L		08/24/16 16:46	08/29/16 18:56	5
Silver	0.038	U	0.13	0.038	mg/L		08/24/16 16:46	08/29/16 18:56	5

Method: 7470A - TCLP Mercury

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.000079	U	0.0010	0.000079	mg/L		08/25/16 17:09	08/26/16 09:44	1

Method: H3-04-RC - Tritium (LSC)

Analyte	Result	Qualifier	Count	Total	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
			(2σ+/-)	(2σ+/-)						
Tritium	0.0408	U	0.222	0.222	1.00	0.391	pCi/g	08/29/16 11:14	09/07/16 21:32	1

Method: SR-03-RC - Total Beta Strontium (GFPC)

Analyte	Result	Qualifier	Count	Total	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
			(2σ+/-)	(2σ+/-)						
Strontium 89/90	0.164	U	0.131	0.131	3.00	0.206	pCi/g	08/25/16 18:10	08/31/16 07:20	1

Carrier	%Yield	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Sr Carrier	75.4		40 - 110	08/25/16 18:10	08/31/16 07:20	1

Method: ST-RC-0301 - Radium-226 (Alpha Spectrometry)

Analyte	Result	Qualifier	Count	Total	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
			(2σ+/-)	(2σ+/-)						
Radium-226	0.557		0.114	0.123	1.00	0.0665	pCi/g	09/15/16 18:53	09/24/16 16:27	1

TestAmerica St. Louis

Client Sample Results

Client: Alliant Corporation

Project/Site: ORNL Y-12 Outfall 200 Characterization

TestAmerica Job ID: 160-18646-1

Client Sample ID: YMTFA56C

Date Collected: 08/15/16 14:38

Date Received: 08/16/16 09:20

Lab Sample ID: 160-18646-5

Matrix: Solid

Tracer	%Yield	Qualifier	Limits
At-217	72.8		30 - 110

Prepared	Analyzed	Dil Fac
09/15/16 18:53	09/24/16 16:27	1

Method: TC-02-RC - Technetium-99 (LSC)

Analyte	Result	Qualifier	Count	Total	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
			Uncert. (2σ+/-)	Uncert. (2σ+/-)						
Technetium-99	0.109	U	0.257	0.257	1.00	0.434	pCi/g	08/23/16 10:56	08/27/16 05:35	1
Tracer	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Tc-99m	89.3		30 - 110					08/23/16 10:56	08/27/16 05:35	1

Client Sample ID: YMTFA55C

Date Collected: 08/15/16 14:45

Date Received: 08/16/16 09:20

Lab Sample ID: 160-18646-6

Matrix: Solid

Method: 8082A - Polychlorinated Biphenyls (PCBs) by Gas Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
PCB-1016	0.0096	U	0.033	0.0096	mg/Kg		08/24/16 10:11	08/26/16 05:35	1
PCB-1221	0.0096	U	0.033	0.0096	mg/Kg		08/24/16 10:11	08/26/16 05:35	1
PCB-1232	0.0096	U	0.033	0.0096	mg/Kg		08/24/16 10:11	08/26/16 05:35	1
PCB-1242	0.0096	U	0.033	0.0096	mg/Kg		08/24/16 10:11	08/26/16 05:35	1
PCB-1248	0.0096	U	0.033	0.0096	mg/Kg		08/24/16 10:11	08/26/16 05:35	1
PCB-1254	0.0080	U	0.033	0.0080	mg/Kg		08/24/16 10:11	08/26/16 05:35	1
PCB-1260	0.0096	J	0.033	0.0080	mg/Kg		08/24/16 10:11	08/26/16 05:35	1
PCB-1262	0.0080	U	0.033	0.0080	mg/Kg		08/24/16 10:11	08/26/16 05:35	1
PCB-1268	0.0080	U	0.033	0.0080	mg/Kg		08/24/16 10:11	08/26/16 05:35	1
Polychlorinated biphenyls, Total	0.0096	J	0.033	0.0080	mg/Kg		08/24/16 10:11	08/26/16 05:35	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
DCB Decachlorobiphenyl (Surrogate)	77		23 - 146				08/24/16 10:11	08/26/16 05:35	1

Method: 6010C - TCLP Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	0.050	U	0.13	0.050	mg/L		08/24/16 16:46	08/29/16 19:01	5
Barium	0.34	J	0.63	0.19	mg/L		08/24/16 16:46	08/29/16 19:01	5
Cadmium	0.019	U	0.063	0.019	mg/L		08/24/16 16:46	08/29/16 19:01	5
Chromium	0.038	U	0.13	0.038	mg/L		08/24/16 16:46	08/29/16 19:01	5
Lead	0.038	U	0.13	0.038	mg/L		08/24/16 16:46	08/29/16 19:01	5
Selenium	0.063	U	0.19	0.063	mg/L		08/24/16 16:46	08/29/16 19:01	5
Silver	0.038	U	0.13	0.038	mg/L		08/24/16 16:46	08/29/16 19:01	5

Method: 7470A - TCLP Mercury

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.000079	U	0.0010	0.000079	mg/L		08/25/16 17:09	08/26/16 09:51	1

Method: H3-04-RC - Tritium (LSC)

Analyte	Result	Qualifier	Count	Total	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
			Uncert. (2σ+/-)	Uncert. (2σ+/-)						
Tritium	-0.249	U	0.189	0.190	1.00	0.381	pCi/g	08/29/16 11:14	09/07/16 21:55	1

TestAmerica St. Louis

Client Sample Results

Client: Alliant Corporation

Project/Site: ORNL Y-12 Outfall 200 Characterization

TestAmerica Job ID: 160-18646-1

Client Sample ID: YMTFA55C

Date Collected: 08/15/16 14:45

Date Received: 08/16/16 09:20

Lab Sample ID: 160-18646-6

Matrix: Solid

Method: SR-03-RC - Total Beta Strontium (GFPC)

Analyte	Result	Qualifier	Count	Total	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
			Uncert.	(2σ+/-)						
Strontium 89/90	0.0440	U	0.110	0.110	3.00	0.192	pCi/g	08/25/16 18:10	08/31/16 07:20	1
<i>Carrier</i>	%Yield	Qualifier	<i>Limits</i>					<i>Prepared</i>	<i>Analyzed</i>	<i>Dil Fac</i>
Sr Carrier	73.3		40 - 110					08/25/16 18:10	08/31/16 07:20	1

Method: ST-RC-0301 - Radium-226 (Alpha Spectrometry)

Analyte	Result	Qualifier	Count	Total	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
			Uncert.	(2σ+/-)						
Radium-226	0.691		0.135	0.147	1.00	0.0812	pCi/g	09/15/16 18:53	09/24/16 16:27	1
<i>Tracer</i>	%Yield	Qualifier	<i>Limits</i>					<i>Prepared</i>	<i>Analyzed</i>	<i>Dil Fac</i>
At-217	59.2		30 - 110					09/15/16 18:53	09/24/16 16:27	1

Method: TC-02-RC - Technetium-99 (LSC)

Analyte	Result	Qualifier	Count	Total	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
			Uncert.	(2σ+/-)						
Technetium-99	0.0852	U	0.217	0.217	1.00	0.365	pCi/g	08/23/16 10:56	08/27/16 06:06	1
<i>Tracer</i>	%Yield	Qualifier	<i>Limits</i>					<i>Prepared</i>	<i>Analyzed</i>	<i>Dil Fac</i>
Tc-99m	104		30 - 110					08/23/16 10:56	08/27/16 06:06	1

TestAmerica St. Louis

QC Sample Results

Client: Alliant Corporation

Project/Site: ORNL Y-12 Outfall 200 Characterization

TestAmerica Job ID: 160-18646-1

Method: 8082A - Polychlorinated Biphenyls (PCBs) by Gas Chromatography

Lab Sample ID: MB 160-266347/1-A

Matrix: Solid

Analysis Batch: 266473

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 266347

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
PCB-1016	0.0096	U	0.033	0.0096	mg/Kg		08/24/16 10:11	08/25/16 22:50	1
PCB-1221	0.0096	U	0.033	0.0096	mg/Kg		08/24/16 10:11	08/25/16 22:50	1
PCB-1232	0.0096	U	0.033	0.0096	mg/Kg		08/24/16 10:11	08/25/16 22:50	1
PCB-1242	0.0096	U	0.033	0.0096	mg/Kg		08/24/16 10:11	08/25/16 22:50	1
PCB-1248	0.0096	U	0.033	0.0096	mg/Kg		08/24/16 10:11	08/25/16 22:50	1
PCB-1254	0.0080	U	0.033	0.0080	mg/Kg		08/24/16 10:11	08/25/16 22:50	1
PCB-1260	0.0080	U	0.033	0.0080	mg/Kg		08/24/16 10:11	08/25/16 22:50	1
PCB-1262	0.0080	U	0.033	0.0080	mg/Kg		08/24/16 10:11	08/25/16 22:50	1
PCB-1268	0.0080	U	0.033	0.0080	mg/Kg		08/24/16 10:11	08/25/16 22:50	1
Polychlorinated biphenyls, Total	0.0080	U	0.033	0.0080	mg/Kg		08/24/16 10:11	08/25/16 22:50	1

MB MB

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
DCB Decachlorobiphenyl (Surr)	79		23 - 146	08/24/16 10:11	08/25/16 22:50	1

Lab Sample ID: MB 160-266347/1-A

Matrix: Solid

Analysis Batch: 267639

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 266347

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
PCB-1016	0.0096	U	0.033	0.0096	mg/Kg		08/24/16 10:11	09/02/16 07:58	1
PCB-1221	0.0096	U	0.033	0.0096	mg/Kg		08/24/16 10:11	09/02/16 07:58	1
PCB-1232	0.0096	U	0.033	0.0096	mg/Kg		08/24/16 10:11	09/02/16 07:58	1
PCB-1242	0.0096	U	0.033	0.0096	mg/Kg		08/24/16 10:11	09/02/16 07:58	1
PCB-1248	0.0096	U	0.033	0.0096	mg/Kg		08/24/16 10:11	09/02/16 07:58	1
PCB-1254	0.0080	U	0.033	0.0080	mg/Kg		08/24/16 10:11	09/02/16 07:58	1
PCB-1260	0.0080	U	0.033	0.0080	mg/Kg		08/24/16 10:11	09/02/16 07:58	1
PCB-1262	0.0080	U	0.033	0.0080	mg/Kg		08/24/16 10:11	09/02/16 07:58	1
PCB-1268	0.0080	U	0.033	0.0080	mg/Kg		08/24/16 10:11	09/02/16 07:58	1
Polychlorinated biphenyls, Total	0.0080	U	0.033	0.0080	mg/Kg		08/24/16 10:11	09/02/16 07:58	1

MB MB

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
DCB Decachlorobiphenyl (Surr)	79		23 - 146	08/24/16 10:11	09/02/16 07:58	1

Lab Sample ID: LCS 160-266347/2-A

Matrix: Solid

Analysis Batch: 266473

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 266347

Analyte	Spike		LCS		D	%Rec	Limits
	Added	Result	Qualifier	Unit			
PCB-1016	0.167	0.129		mg/Kg		78	52 - 134
PCB-1260	0.167	0.119		mg/Kg		71	50 - 132
Surrogate							
DCB Decachlorobiphenyl (Surr)	74		23 - 146				

TestAmerica St. Louis

QC Sample Results

Client: Alliant Corporation

Project/Site: ORNL Y-12 Outfall 200 Characterization

TestAmerica Job ID: 160-18646-1

Method: 8082A - Polychlorinated Biphenyls (PCBs) by Gas Chromatography (Continued)

Lab Sample ID: LCS 160-266347/2-A

Matrix: Solid

Analysis Batch: 267639

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 266347

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	Limits
PCB-1016	0.167	0.121		mg/Kg		73	52 - 134
PCB-1260	0.167	0.121		mg/Kg		73	50 - 132
Surrogate	LCS %Recovery	Qualifer	Limits				
DCB Decachlorobiphenyl (Surr)	74		23 - 146				

Lab Sample ID: 160-18632-A-1-K MS

Matrix: Solid

Analysis Batch: 266473

Client Sample ID: Matrix Spike

Prep Type: Total/NA

Prep Batch: 266347

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	Limits
PCB-1016	0.0096	U	0.166	0.168		mg/Kg		101	23 - 140
PCB-1260	0.0080	U	0.166	0.174		mg/Kg		105	20 - 131
Surrogate	MS %Recovery	Qualifer	Limits						
DCB Decachlorobiphenyl (Surr)	94		23 - 146						

Lab Sample ID: 160-18632-A-1-L MSD

Matrix: Solid

Analysis Batch: 266473

Client Sample ID: Matrix Spike Duplicate

Prep Type: Total/NA

Prep Batch: 266347

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	RPD	RPD Limit
PCB-1016	0.0096	U	0.166	0.163		mg/Kg		98	23 - 140	3 30
PCB-1260	0.0080	U	0.166	0.162		mg/Kg		98	20 - 131	7 30
Surrogate	MSD %Recovery	Qualifer	Limits							
DCB Decachlorobiphenyl (Surr)	88		23 - 146							

Method: 6010C - TCLP Metals (ICP)

Lab Sample ID: LB 160-266051/1-B

Matrix: Solid

Analysis Batch: 267251

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 266426

Analyte	LB Result	LB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	0.010	U	0.025	0.010	mg/L		08/24/16 16:46	08/29/16 18:01	1
Barium	0.038	U	0.13	0.038	mg/L		08/24/16 16:46	08/29/16 18:01	1
Cadmium	0.0038	U	0.013	0.0038	mg/L		08/24/16 16:46	08/29/16 18:01	1
Chromium	0.0075	U	0.025	0.0075	mg/L		08/24/16 16:46	08/29/16 18:01	1
Lead	0.0075	U	0.025	0.0075	mg/L		08/24/16 16:46	08/29/16 18:01	1
Selenium	0.013	U	0.038	0.013	mg/L		08/24/16 16:46	08/29/16 18:01	1
Silver	0.0075	U	0.025	0.0075	mg/L		08/24/16 16:46	08/29/16 18:01	1

TestAmerica St. Louis

QC Sample Results

Client: Alliant Corporation

Project/Site: ORNL Y-12 Outfall 200 Characterization

TestAmerica Job ID: 160-18646-1

Method: 6010C - TCLP Metals (ICP) (Continued)

Lab Sample ID: LCS 160-266426/2-A

Matrix: Solid

Analysis Batch: 267251

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 266426

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	Limits
Arsenic	2.50	2.51		mg/L	101	80 - 120	
Barium	2.50	2.53		mg/L	101	80 - 120	
Cadmium	2.50	2.48		mg/L	99	80 - 120	
Chromium	2.50	2.60		mg/L	104	80 - 120	
Lead	2.50	2.62		mg/L	105	80 - 120	
Selenium	1.25	1.33		mg/L	107	80 - 120	
Silver	0.500	0.503		mg/L	101	80 - 120	

Lab Sample ID: 160-18646-1 MS

Matrix: Solid

Analysis Batch: 267251

Client Sample ID: YMTFA72C

Prep Type: Total/NA

Prep Batch: 266426

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	Limits
Arsenic	0.050	U	2.50	2.77		mg/L	111	75 - 125	
Barium	0.57	J	2.50	3.25		mg/L	107	75 - 125	
Cadmium	0.019	U	2.50	2.77		mg/L	111	75 - 125	
Chromium	0.038	U	2.50	2.78		mg/L	111	75 - 125	
Lead	0.038	U	2.50	2.83		mg/L	113	75 - 125	
Selenium	0.063	U	1.25	1.39		mg/L	111	75 - 125	
Silver	0.038	U	0.500	0.540		mg/L	108	75 - 125	

Lab Sample ID: 160-18646-1 MSD

Matrix: Solid

Analysis Batch: 267251

Client Sample ID: YMTFA72C

Prep Type: Total/NA

Prep Batch: 266426

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	RPD	RPD Limit
Arsenic	0.050	U	2.50	2.79		mg/L	112	75 - 125	1	20
Barium	0.57	J	2.50	3.29		mg/L	109	75 - 125	1	20
Cadmium	0.019	U	2.50	2.78		mg/L	111	75 - 125	0	20
Chromium	0.038	U	2.50	2.78		mg/L	111	75 - 125	0	20
Lead	0.038	U	2.50	2.84		mg/L	114	75 - 125	0	20
Selenium	0.063	U	1.25	1.40		mg/L	112	75 - 125	1	20
Silver	0.038	U	0.500	0.541		mg/L	108	75 - 125	0	20

Method: 7470A - TCLP Mercury

Lab Sample ID: LB 160-266051/1-C

Matrix: Solid

Analysis Batch: 267023

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 266713

Analyte	LB Result	LB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.000079	U	0.0010	0.000079	mg/L	08/25/16	17:09	08/26/16 09:25	1

Lab Sample ID: LCS 160-266713/2-A

Matrix: Solid

Analysis Batch: 267023

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 266713

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	Limits
Mercury	0.0250	0.0257		mg/L	103	80 - 120	

TestAmerica St. Louis

QC Sample Results

Client: Alliant Corporation

Project/Site: ORNL Y-12 Outfall 200 Characterization

TestAmerica Job ID: 160-18646-1

Lab Sample ID: 160-18646-1 MS

Matrix: Solid

Analysis Batch: 267023

Client Sample ID: YMTFA72C

Prep Type: Total/NA

Prep Batch: 266713

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec.
Mercury	0.000079	U	0.0250	0.0262		mg/L	105	70 - 130	

Lab Sample ID: 160-18646-1 MSD

Matrix: Solid

Analysis Batch: 267023

Client Sample ID: YMTFA72C

Prep Type: Total/NA

Prep Batch: 266713

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec.	RPD
Mercury	0.000079	U	0.0250	0.0268		mg/L	107	70 - 130	2	20

Method: H3-04-RC - Tritium (LSC)

Lab Sample ID: MB 160-267085/1-A

Matrix: Solid

Analysis Batch: 268573

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 267085

Analyte	MB		Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)		RL	MDC	Unit	Prepared	Analyzed	Dil Fac
	Result	Qualifier		(2σ+/-)	(2σ+/-)						
Tritium	-0.1423	U	0.197	0.197	1.00	1.00	0.373	pCi/g	08/29/16 11:14	09/07/16 18:31	1

Lab Sample ID: LCS 160-267085/2-A

Matrix: Solid

Analysis Batch: 268573

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 267085

Analyte	Spike Added	LCS		Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec.
		Result	Qual						
Tritium	10.1	8.918		1.01	1.00	0.378	pCi/g	88	80 - 114

Lab Sample ID: 160-18646-3 MS

Matrix: Solid

Analysis Batch: 268573

Client Sample ID: YMTFA58C

Prep Type: Total/NA

Prep Batch: 267085

Analyte	Sample Result	Sample Qual	Spike Added	MS Result	MS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec.
Tritium	-0.0655	U	10.1	8.189		0.948	1.00	0.377	pCi/g	81	78 - 122

Lab Sample ID: 160-18646-1 DU

Matrix: Solid

Analysis Batch: 268573

Client Sample ID: YMTFA72C

Prep Type: Total/NA

Prep Batch: 267085

Analyte	Sample Result	Sample Qual	DU	DU	Total Uncert. (2σ+/-)	RL	MDC	Unit	RER	RER Limit
Tritium	0.00840	U	-0.1609	U	0.195	1.00	0.372	pCi/g	0.41	1

TestAmerica St. Louis

QC Sample Results

Client: Alliant Corporation

Project/Site: ORNL Y-12 Outfall 200 Characterization

TestAmerica Job ID: 160-18646-1

Method: SR-03-RC - Total Beta Strontium (GFPC)

Lab Sample ID: MB 160-266721/1-A

Matrix: Solid

Analysis Batch: 267344

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 266721

Analyte	MB MB		Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
	Result	Qualifier								
Strontium 89/90	-0.06641	U	0.125	0.125	3.00	0.234	pCi/g	08/25/16 18:10	08/30/16 21:42	1
Carrier										
<i>Sr Carrier</i>	MB MB		Limits				Prepared		Analyzed	Dil Fac
	%Yield	Qualifier	40 - 110				08/25/16 18:10		08/30/16 21:42	1

Lab Sample ID: LCS 160-266721/2-A

Matrix: Solid

Analysis Batch: 267344

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 266721

Analyte	Spike		LCS Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec.	Limits
	Sample Result	Sample Qual									
Strontium 89/90	8.60	6.856	0.635	3.00	0.204	pCi/g	80	75 - 125			
Carrier											
<i>Sr Carrier</i>	LCS LCS		Limits				87.4		40 - 110		
	%Yield	Qualifier									

Lab Sample ID: 160-18646-4 DU

Matrix: Solid

Analysis Batch: 267477

Client Sample ID: YMTFA57C

Prep Type: Total/NA

Prep Batch: 266721

Analyte	Sample		DU Result	DU Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	RER	Limit	
	Sample Result	Sample Qual									
Strontium 89/90	0.129	U	0.03299	U	0.108	3.00	0.189	pCi/g	0.42	1	
Carrier											
<i>Sr Carrier</i>	DU DU		Limits				83.5		40 - 110		
	%Yield	Qualifier									

Method: ST-RC-0301 - Radium-226 (Alpha Spectrometry)

Lab Sample ID: MB 160-270100/1-A

Matrix: Solid

Analysis Batch: 271464

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 270100

Analyte	MB MB		Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac	
	Result	Qualifier									
Radium-226	0.2916	U	0.101	0.104	1.00	0.0976	pCi/g	09/15/16 18:53	09/24/16 16:27	1	
Tracer											
<i>At-217</i>	MB MB		Limits				52.8		30 - 110		
	%Yield	Qualifier									

TestAmerica St. Louis

QC Sample Results

Client: Alliant Corporation

TestAmerica Job ID: 160-18646-1

Project/Site: ORNL Y-12 Outfall 200 Characterization

Method: ST-RC-0301 - Radium-226 (Alpha Spectrometry) (Continued)

Lab Sample ID: LCS 160-270100/2-A

Matrix: Solid

Analysis Batch: 271465

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 270100

Analyte	Spike Added	LCS		Uncert. (2σ+/-)	Total		RL	MDC	Unit	%Rec.	%Rec. Limits
		Result	Qual		(2σ+/-)	1.41					
Radium-226	12.1	14.99		1.41	1.41	1.00	0.0826	pCi/g	124	70 - 130	
<i>Tracer</i>											
At-217	52.2			30 - 110							

Lab Sample ID: 160-18646-5 DU

Matrix: Solid

Analysis Batch: 271471

Client Sample ID: YMTFA56C

Prep Type: Total/NA

Prep Batch: 270100

Analyte	Sample		DU		Total		RL	MDC	Unit	RER	RER Limit
	Result	Qual	Result	Qual	Uncert. (2σ+/-)	1.00					
Radium-226	0.557		0.5021		0.128	1.00	0.0904	pCi/g	0.22	1	
<i>Tracer</i>											
At-217	58.9			30 - 110							

Method: TC-02-RC - Technetium-99 (LSC)

Lab Sample ID: MB 160-266075/1-A

Matrix: Solid

Analysis Batch: 266901

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 266075

Analyte	MB		Count (2σ+/-)	Total		RL	MDC	Unit	Prepared	Analyzed	Dil Fac
	Result	Qualifier		Uncert. (2σ+/-)	1.00						
Technetium-99	-0.01997	U	0.193	0.193	1.00	0.331	pCi/g	08/23/16 10:56	08/26/16 21:19	1	
<i>Tracer</i>											
Tc-99m	96.7		30 - 110						08/23/16 10:56	08/26/16 21:19	1

Lab Sample ID: LCS 160-266075/2-A

Matrix: Solid

Analysis Batch: 266901

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 266075

Analyte	Spike		LCS (2σ+/-)	Total		RL	MDC	Unit	%Rec.	%Rec. Limits
	Added	Result		Qual	(2σ+/-)					
Technetium-99	29.0	30.09	3.00	3.00	1.00	0.354	pCi/g	104	75 - 125	
<i>Tracer</i>										
Tc-99m	89.7		30 - 110							

TestAmerica St. Louis

QC Sample Results

Client: Alliant Corporation

Project/Site: ORNL Y-12 Outfall 200 Characterization

TestAmerica Job ID: 160-18646-1

Method: TC-02-RC - Technetium-99 (LSC) (Continued)

Lab Sample ID: 160-18632-A-1-G DU

Matrix: Solid

Analysis Batch: 266901

Client Sample ID: Duplicate

Prep Type: Total/NA

Prep Batch: 266075

Analyte	Sample	Sample	DU		DU		Total		RL	MDC	Unit	RER	RER	Limit
	Result	Qual	Result	Qual	(2 σ +/-)									
Technetium-99	0.119	U	-0.02995	U	0.231		1.00	0.399	pCi/g			0.31		1
<i>Tracer</i>														
Tc-99m	95.6				30 - 110									

QC Association Summary

Client: Alliant Corporation

Project/Site: ORNL Y-12 Outfall 200 Characterization

TestAmerica Job ID: 160-18646-1

GC Semi VOA

ISM Prep Batch: 265251

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-18632-A-1-K MS	Matrix Spike	Total/NA	Solid	Increment, Prep	
160-18632-A-1-L MSD	Matrix Spike Duplicate	Total/NA	Solid	Increment, Prep	

ISM Prep Batch: 265348

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-18646-1	YMTFA72C	Total/NA	Solid	Increment, Prep	
160-18646-2	YMTFA65C	Total/NA	Solid	Increment, Prep	
160-18646-3	YMTFA58C	Total/NA	Solid	Increment, Prep	
160-18646-4	YMTFA57C	Total/NA	Solid	Increment, Prep	
160-18646-5	YMTFA56C	Total/NA	Solid	Increment, Prep	
160-18646-6	YMTFA55C	Total/NA	Solid	Increment, Prep	

Prep Batch: 266347

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-18646-1	YMTFA72C	Total/NA	Solid	3550C	265348
160-18646-2	YMTFA65C	Total/NA	Solid	3550C	265348
160-18646-3	YMTFA58C	Total/NA	Solid	3550C	265348
160-18646-4	YMTFA57C	Total/NA	Solid	3550C	265348
160-18646-5	YMTFA56C	Total/NA	Solid	3550C	265348
160-18646-6	YMTFA55C	Total/NA	Solid	3550C	265348
MB 160-266347/1-A	Method Blank	Total/NA	Solid	3550C	
LCS 160-266347/2-A	Lab Control Sample	Total/NA	Solid	3550C	
160-18632-A-1-K MS	Matrix Spike	Total/NA	Solid	3550C	265251
160-18632-A-1-L MSD	Matrix Spike Duplicate	Total/NA	Solid	3550C	265251

Analysis Batch: 266473

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-18646-2	YMTFA65C	Total/NA	Solid	8082A	266347
160-18646-3	YMTFA58C	Total/NA	Solid	8082A	266347
160-18646-4	YMTFA57C	Total/NA	Solid	8082A	266347
160-18646-5	YMTFA56C	Total/NA	Solid	8082A	266347
160-18646-6	YMTFA55C	Total/NA	Solid	8082A	266347
MB 160-266347/1-A	Method Blank	Total/NA	Solid	8082A	266347
LCS 160-266347/2-A	Lab Control Sample	Total/NA	Solid	8082A	266347
160-18632-A-1-K MS	Matrix Spike	Total/NA	Solid	8082A	266347
160-18632-A-1-L MSD	Matrix Spike Duplicate	Total/NA	Solid	8082A	266347

Analysis Batch: 267639

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-18646-1	YMTFA72C	Total/NA	Solid	8082A	266347
MB 160-266347/1-A	Method Blank	Total/NA	Solid	8082A	266347
LCS 160-266347/2-A	Lab Control Sample	Total/NA	Solid	8082A	266347

Metals

ISM Prep Batch: 265348

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-18646-1	YMTFA72C	Total/NA	Solid	Increment, Prep	
160-18646-2	YMTFA65C	Total/NA	Solid	Increment, Prep	
160-18646-3	YMTFA58C	Total/NA	Solid	Increment, Prep	

TestAmerica St. Louis

QC Association Summary

Client: Alliant Corporation

Project/Site: ORNL Y-12 Outfall 200 Characterization

TestAmerica Job ID: 160-18646-1

Metals (Continued)

ISM Prep Batch: 265348 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-18646-4	YMTFA57C	Total/NA	Solid	Increment, Prep	
160-18646-5	YMTFA56C	Total/NA	Solid	Increment, Prep	
160-18646-6	YMTFA55C	Total/NA	Solid	Increment, Prep	
160-18646-1 MS	YMTFA72C	Total/NA	Solid	Increment, Prep	
160-18646-1 MSD	YMTFA72C	Total/NA	Solid	Increment, Prep	

Leach Batch: 266051

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-18646-1	YMTFA72C	Total/NA	Solid	1311	265348
160-18646-2	YMTFA65C	Total/NA	Solid	1311	265348
160-18646-3	YMTFA58C	Total/NA	Solid	1311	265348
160-18646-4	YMTFA57C	Total/NA	Solid	1311	265348
160-18646-5	YMTFA56C	Total/NA	Solid	1311	265348
160-18646-6	YMTFA55C	Total/NA	Solid	1311	265348
LB 160-266051/1-B	Method Blank	Total/NA	Solid	1311	
LB 160-266051/1-C	Method Blank	Total/NA	Solid	1311	
160-18646-1 MS	YMTFA72C	Total/NA	Solid	1311	265348
160-18646-1 MSD	YMTFA72C	Total/NA	Solid	1311	265348

Prep Batch: 266426

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-18646-1	YMTFA72C	Total/NA	Solid	3010A	266051
160-18646-2	YMTFA65C	Total/NA	Solid	3010A	266051
160-18646-3	YMTFA58C	Total/NA	Solid	3010A	266051
160-18646-4	YMTFA57C	Total/NA	Solid	3010A	266051
160-18646-5	YMTFA56C	Total/NA	Solid	3010A	266051
160-18646-6	YMTFA55C	Total/NA	Solid	3010A	266051
LB 160-266051/1-B	Method Blank	Total/NA	Solid	3010A	266051
LCS 160-266426/2-A	Lab Control Sample	Total/NA	Solid	3010A	
160-18646-1 MS	YMTFA72C	Total/NA	Solid	3010A	266051
160-18646-1 MSD	YMTFA72C	Total/NA	Solid	3010A	266051

Prep Batch: 266713

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-18646-1	YMTFA72C	Total/NA	Solid	7470A	266051
160-18646-2	YMTFA65C	Total/NA	Solid	7470A	266051
160-18646-3	YMTFA58C	Total/NA	Solid	7470A	266051
160-18646-4	YMTFA57C	Total/NA	Solid	7470A	266051
160-18646-5	YMTFA56C	Total/NA	Solid	7470A	266051
160-18646-6	YMTFA55C	Total/NA	Solid	7470A	266051
LB 160-266051/1-C	Method Blank	Total/NA	Solid	7470A	266051
LCS 160-266713/2-A	Lab Control Sample	Total/NA	Solid	7470A	
160-18646-1 MS	YMTFA72C	Total/NA	Solid	7470A	266051
160-18646-1 MSD	YMTFA72C	Total/NA	Solid	7470A	266051

Analysis Batch: 267023

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-18646-1	YMTFA72C	Total/NA	Solid	7470A	266713
160-18646-2	YMTFA65C	Total/NA	Solid	7470A	266713
160-18646-3	YMTFA58C	Total/NA	Solid	7470A	266713
160-18646-4	YMTFA57C	Total/NA	Solid	7470A	266713

TestAmerica St. Louis

QC Association Summary

Client: Alliant Corporation

Project/Site: ORNL Y-12 Outfall 200 Characterization

TestAmerica Job ID: 160-18646-1

Metals (Continued)

Analysis Batch: 267023 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-18646-5	YMTFA56C	Total/NA	Solid	7470A	266713
160-18646-6	YMTFA55C	Total/NA	Solid	7470A	266713
LB 160-266051/1-C	Method Blank	Total/NA	Solid	7470A	266713
LCS 160-266713/2-A	Lab Control Sample	Total/NA	Solid	7470A	266713
160-18646-1 MS	YMTFA72C	Total/NA	Solid	7470A	266713
160-18646-1 MSD	YMTFA72C	Total/NA	Solid	7470A	266713

Analysis Batch: 267251

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-18646-1	YMTFA72C	Total/NA	Solid	6010C	266426
160-18646-2	YMTFA65C	Total/NA	Solid	6010C	266426
160-18646-3	YMTFA58C	Total/NA	Solid	6010C	266426
160-18646-4	YMTFA57C	Total/NA	Solid	6010C	266426
160-18646-5	YMTFA56C	Total/NA	Solid	6010C	266426
160-18646-6	YMTFA55C	Total/NA	Solid	6010C	266426
LB 160-266051/1-B	Method Blank	Total/NA	Solid	6010C	266426
LCS 160-266426/2-A	Lab Control Sample	Total/NA	Solid	6010C	266426
160-18646-1 MS	YMTFA72C	Total/NA	Solid	6010C	266426
160-18646-1 MSD	YMTFA72C	Total/NA	Solid	6010C	266426

Rad

ISM Prep Batch: 265348

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-18646-1	YMTFA72C	Total/NA	Solid	Increment, Prep	
160-18646-2	YMTFA65C	Total/NA	Solid	Increment, Prep	
160-18646-3	YMTFA58C	Total/NA	Solid	Increment, Prep	
160-18646-4	YMTFA57C	Total/NA	Solid	Increment, Prep	
160-18646-5	YMTFA56C	Total/NA	Solid	Increment, Prep	
160-18646-6	YMTFA55C	Total/NA	Solid	Increment, Prep	
160-18646-4 DU	YMTFA57C	Total/NA	Solid	Increment, Prep	
160-18646-5 DU	YMTFA56C	Total/NA	Solid	Increment, Prep	

Prep Batch: 266075

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-18646-1	YMTFA72C	Total/NA	Solid	Ext_Chrom_LSC	
160-18646-2	YMTFA65C	Total/NA	Solid	Ext_Chrom_LSC	
160-18646-3	YMTFA58C	Total/NA	Solid	Ext_Chrom_LSC	
160-18646-4	YMTFA57C	Total/NA	Solid	Ext_Chrom_LSC	
160-18646-5	YMTFA56C	Total/NA	Solid	Ext_Chrom_LSC	
160-18646-6	YMTFA55C	Total/NA	Solid	Ext_Chrom_LSC	
MB 160-266075/1-A	Method Blank	Total/NA	Solid	Ext_Chrom_LSC	
LCS 160-266075/2-A	Lab Control Sample	Total/NA	Solid	Ext_Chrom_LSC	
160-18632-A-1-G DU	Duplicate	Total/NA	Solid	Ext_Chrom_LSC	

Prep Batch: 266721

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-18646-1	YMTFA72C	Total/NA	Solid	DPS-0	265348
160-18646-2	YMTFA65C	Total/NA	Solid	DPS-0	265348
160-18646-3	YMTFA58C	Total/NA	Solid	DPS-0	265348

TestAmerica St. Louis

QC Association Summary

Client: Alliant Corporation

Project/Site: ORNL Y-12 Outfall 200 Characterization

TestAmerica Job ID: 160-18646-1

Rad (Continued)

Prep Batch: 266721 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-18646-4	YMTFA57C	Total/NA	Solid	DPS-0	265348
160-18646-5	YMTFA56C	Total/NA	Solid	DPS-0	265348
160-18646-6	YMTFA55C	Total/NA	Solid	DPS-0	265348
MB 160-266721/1-A	Method Blank	Total/NA	Solid	DPS-0	
LCS 160-266721/2-A	Lab Control Sample	Total/NA	Solid	DPS-0	
160-18646-4 DU	YMTFA57C	Total/NA	Solid	DPS-0	265348

Prep Batch: 267085

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-18646-1	YMTFA72C	Total/NA	Solid	LSC_Dist_Susp	
160-18646-2	YMTFA65C	Total/NA	Solid	LSC_Dist_Susp	
160-18646-3	YMTFA58C	Total/NA	Solid	LSC_Dist_Susp	
160-18646-4	YMTFA57C	Total/NA	Solid	LSC_Dist_Susp	
160-18646-5	YMTFA56C	Total/NA	Solid	LSC_Dist_Susp	
160-18646-6	YMTFA55C	Total/NA	Solid	LSC_Dist_Susp	
MB 160-267085/1-A	Method Blank	Total/NA	Solid	LSC_Dist_Susp	
LCS 160-267085/2-A	Lab Control Sample	Total/NA	Solid	LSC_Dist_Susp	
160-18646-3 MS	YMTFA58C	Total/NA	Solid	LSC_Dist_Susp	
160-18646-1 DU	YMTFA72C	Total/NA	Solid	LSC_Dist_Susp	

Prep Batch: 270100

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-18646-1	YMTFA72C	Total/NA	Solid	DPS-0	265348
160-18646-2	YMTFA65C	Total/NA	Solid	DPS-0	265348
160-18646-3	YMTFA58C	Total/NA	Solid	DPS-0	265348
160-18646-4	YMTFA57C	Total/NA	Solid	DPS-0	265348
160-18646-5	YMTFA56C	Total/NA	Solid	DPS-0	265348
160-18646-6	YMTFA55C	Total/NA	Solid	DPS-0	265348
MB 160-270100/1-A	Method Blank	Total/NA	Solid	DPS-0	
LCS 160-270100/2-A	Lab Control Sample	Total/NA	Solid	DPS-0	
160-18646-5 DU	YMTFA56C	Total/NA	Solid	DPS-0	265348

Surrogate Summary

Client: Alliant Corporation

Project/Site: ORNL Y-12 Outfall 200 Characterization

TestAmerica Job ID: 160-18646-1

Method: 8082A - Polychlorinated Biphenyls (PCBs) by Gas Chromatography

Matrix: Solid

Prep Type: Total/NA

		Percent Surrogate Recovery (Acceptance Limits)	
Lab Sample ID	Client Sample ID	DCB1	
		(23-146)	
160-18632-A-1-K MS	Matrix Spike	94	
160-18632-A-1-L MSD	Matrix Spike Duplicate	88	
160-18646-1	YMTFA72C	86	
160-18646-2	YMTFA65C	95	
160-18646-3	YMTFA58C	73	
160-18646-4	YMTFA57C	77	
160-18646-6	YMTFA55C	77	
LCS 160-266347/2-A	Lab Control Sample	74	
LCS 160-266347/2-A	Lab Control Sample	74	
MB 160-266347/1-A	Method Blank	79	
MB 160-266347/1-A	Method Blank	79	

Surrogate Legend

DCB = DCB Decachlorobiphenyl (Surr)

Method: 8082A - Polychlorinated Biphenyls (PCBs) by Gas Chromatography

Matrix: Solid

Prep Type: Total/NA

		Percent Surrogate Recovery (Acceptance Limits)				
Lab Sample ID	Client Sample ID	DCB2 (23-146)	75	_____	_____	_____
160-18646-5	YMTFA56C					

Surrogate Legend

DCB = DCB Decachlorobiphenyl (Surr)

Tracer/Carrier Summary

Client: Alliant Corporation

Project/Site: ORNL Y-12 Outfall 200 Characterization

TestAmerica Job ID: 160-18646-1

Method: SR-03-RC - Total Beta Strontium (GFPC)

Matrix: Solid

Prep Type: Total/NA

Lab Sample ID	Client Sample ID	Sr (C) (40-110)	Percent Yield (Acceptance Limits)					
			100	105	110	115	120	125
160-18646-1	YMTFA72C	120 S						
160-18646-2	YMTFA65C	113 S						
160-18646-3	YMTFA58C	74.2						
160-18646-4	YMTFA57C	82.1						
160-18646-4 DU	YMTFA57C	83.5						
160-18646-5	YMTFA56C	75.4						
160-18646-6	YMTFA55C	73.3						
LCS 160-266721/2-A	Lab Control Sample	87.4						
MB 160-266721/1-A	Method Blank	84.9						

Tracer/Carrier Legend

Sr (C) = Sr Carrier

Method: ST-RC-0301 - Radium-226 (Alpha Spectrometry)

Matrix: Solid

Prep Type: Total/NA

Lab Sample ID	Client Sample ID	Percent Yield (Acceptance Limits)				
		At-217		(30-110)		
160-18646-1	YMTFA72C	60.2				
160-18646-2	YMTFA65C	67.4				
160-18646-3	YMTFA58C	71.2				
160-18646-4	YMTFA57C	65.8				
160-18646-5	YMTFA56C	72.8				
160-18646-5 DU	YMTFA56C	58.9				
160-18646-6	YMTFA55C	59.2				
LCS 160-270100/2-A	Lab Control Sample	52.2				
MB 160-270100/1-A	Method Blank	52.8				

Tracer/Carrier Legend

At-217 = At-217

Method: TC-02-RC - Technetium-99 (LSC)

Matrix: Solid

Prep Type: Total/NA

Lab Sample ID	Client Sample ID	Percent Yield (Acceptance Limits)				
		Tc-99m (30-110)				
160-18632-A-1-G DU	Duplicate	95.6				
160-18646-1	YMTFA72C	98.5				
160-18646-2	YMTFA65C	90.1				
160-18646-3	YMTFA58C	99.0				
160-18646-4	YMTFA57C	88.9				
160-18646-5	YMTFA56C	89.3				
160-18646-6	YMTFA55C	104				
LCS 160-266075/2-A	Lab Control Sample	89.7				
MB 160-266075/1-A	Method Blank	96.7				

Tracer/Carrier Legend

Tc-99m = Tc-99m

TestAmerica St. Louis

Analytical Data Package Prepared For

TESTAMERICA ST. LOUIS**Radiochemical Analysis By
TestAmerica Inc*****2800 G.W. Way, Richland Wa, 99354, (509)-375-3131.*****Assigned Laboratory Code: TA-RL*****Data Package Contains 31 Pages*****Report No.: 69444****Results in this report relate only to the sample(s) analyzed.**

SDG No.	Order No.	Client Sample ID (List Order)	Lot-Sa No.	Work Order	Report DB ID	Batch No.
51987		YMTFA55C(160-18646-6)	J6H240415-6	M85TM1AE	9M85TM10	6237031
		YMTFA55C(160-18646-6)	J6H240415-6	M85TM1AG	9M85TM10	6237032
		YMTFA55C(160-18646-6)	J6H240415-6	M85TM1AC	9M85TM10	6237033
		YMTFA55C(160-18646-6)	J6H240415-6	M85TM1AF	9M85TM10	6237034
		YMTFA55C(160-18646-6)	J6H240415-6	M85TM1AA	9M85TM10	6237035
		YMTFA55C(160-18646-6)	J6H240415-6	M85TM1AD	9M85TM10	6237036
		YMTFA56C(160-18646-5)	J6H240415-5	M85TL1AE	9M85TL10	6237031
		YMTFA56C(160-18646-5)	J6H240415-5	M85TL1AG	9M85TL10	6237032
		YMTFA56C(160-18646-5)	J6H240415-5	M85TL1AC	9M85TL10	6237033
		YMTFA56C(160-18646-5)	J6H240415-5	M85TL1AF	9M85TL10	6237034
		YMTFA56C(160-18646-5)	J6H240415-5	M85TL1AA	9M85TL10	6237035
		YMTFA56C(160-18646-5)	J6H240415-5	M85TL1AD	9M85TL10	6237036
		YMTFA57C(160-18646-4)	J6H240415-4	M85TK1AE	9M85TK10	6237031
		YMTFA57C(160-18646-4)	J6H240415-4	M85TK1AG	9M85TK10	6237032
		YMTFA57C(160-18646-4)	J6H240415-4	M85TK1AC	9M85TK10	6237033
		YMTFA57C(160-18646-4)	J6H240415-4	M85TK1AF	9M85TK10	6237034
		YMTFA57C(160-18646-4)	J6H240415-4	M85TK1AA	9M85TK10	6237035
		YMTFA57C(160-18646-4)	J6H240415-4	M85TK1AD	9M85TK10	6237036
		YMTFA58C(160-18646-3)	J6H240415-3	M85TJ1AE	9M85TJ10	6237031
		YMTFA58C(160-18646-3)	J6H240415-3	M85TJ1AG	9M85TJ10	6237032
		YMTFA58C(160-18646-3)	J6H240415-3	M85TJ1AC	9M85TJ10	6237033
		YMTFA58C(160-18646-3)	J6H240415-3	M85TJ1AF	9M85TJ10	6237034
		YMTFA58C(160-18646-3)	J6H240415-3	M85TJ1AA	9M85TJ10	6237035
		YMTFA58C(160-18646-3)	J6H240415-3	M85TJ1AD	9M85TJ10	6237036
		YMTFA65C(160-18646-2)	J6H240415-2	M85TF1AE	9M85TF10	6237031
		YMTFA65C(160-18646-2)	J6H240415-2	M85TF1AG	9M85TF10	6237032

Report No.: 69444

Results in this report relate only to the sample(s) analyzed.

SDG No.	Order No.	Client Sample ID (List Order)	Lot-Sa No.	Work Order	Report DB ID	Batch No.
51987		YMTFA65C(160-18646-2)	J6H240415-2	M85TF1AC	9M85TF10	6237033
		YMTFA65C(160-18646-2)	J6H240415-2	M85TF1AF	9M85TF10	6237034
		YMTFA65C(160-18646-2)	J6H240415-2	M85TF1AA	9M85TF10	6237035
		YMTFA65C(160-18646-2)	J6H240415-2	M85TF1AD	9M85TF10	6237036
		YMTFA72C(160-18646-1)	J6H240415-1	M85R91AE	9M85R910	6237031
		YMTFA72C(160-18646-1)	J6H240415-1	M85R91AG	9M85R910	6237032
		YMTFA72C(160-18646-1)	J6H240415-1	M85R91AC	9M85R910	6237033
		YMTFA72C(160-18646-1)	J6H240415-1	M85R91AF	9M85R910	6237034
		YMTFA72C(160-18646-1)	J6H240415-1	M85R91AA	9M85R910	6237035
		YMTFA72C(160-18646-1)	J6H240415-1	M85R91AD	9M85R910	6237036



Certificate of Analysis

October 4, 2016

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045

Attention: Erika Gish

Date Received in Lab	:	August 24, 2016
Sample Type	:	Six (6) Solid
SDG Number	:	51987
Job Number	:	160-18646-1
Project Number/Name	:	16005502/ORNL Y-12 Outfall 200 Characterization

CASE NARRATIVE

I. Introduction

On August 24, 2016, six solid samples were received at the TestAmerica Richland laboratory for radiochemical analysis. Upon receipt the samples were assigned to Lot Number J6H240415 with the laboratory ID number corresponding to the client ID as shown on the cover page.

II. Sample Receipt

The samples were received in good condition; no anomalies were noted upon check-in.

III. Analytical Results/Methodology

The analytical results for this report are presented by laboratory sample ID. Each set of data includes sample identification information; analytical results and the appropriate associated statistical uncertainties.

The analyses requested were:

Alpha Spectroscopy

Americium 241 by method RL-ALP-001
Neptunium-237 by method RL-ALP-013
Plutonium-238, -239/240 by method RL-ALP-002
Thorium-228,230,232 by method RL-ALP-001
Uranium 234, 235 and 238 by method RL-ALP-004

Liquid Scintillation Counting

Carbon-14 by method RL-LSC-008

IV. Quality Control

The analytical result for each analysis performed includes a minimum of one laboratory control sample (LCS), and one reagent blank sample analysis. Any exceptions have been noted in the "Comments" section.

V. Comments

Alpha Spectroscopy

Americium 241 by method RL-ALP-003:

The LCS, batch blank, sample duplicate and sample results are within acceptance limits

Neptunium-237 by method RL-ALP-013:

The LCS, batch blank, sample duplicate and sample results are within acceptance limits

Plutonium-238, -239/240 by method RL-ALP-002:

The LCS, batch blank, sample duplicate and sample results are within acceptance limits

Thorium-228,230,232 by method RL-ALP-001

The LCS, batch blank, sample duplicate and sample results are within acceptance limits

Uranium 234, 235 and 238 by method RL-ALP-004:

The LCS, batch blank, sample duplicate and sample results are within acceptance limits

Liquid Scintillation Counting

Carbon-14 by method RL-LSC-008:

The LCS, batch blank, sample duplicate and sample results are within acceptance limits.

I certify that this Certificate of Analysis is in compliance with the SOW and/or NELAC, both technically and for completeness, for other than the conditions detailed above. The Laboratory Manager or a designee, as verified by the following signature has authorized release of the data contained in this hard copy data package.

Reviewed and approved:

Roger A. Stringer

Digitally signed by Roger A. Stringer
DN: cn=Roger A. Stringer, o, ou, email=Roger.Stringer@testamericainc.com, c=US
Date: 2016.10.04 16:06:30 -07'00'

Roger A. Stringer
Project Manager

Drinking Water Method Cross References

DRINKING WATER ASTM METHOD CROSS REFERENCES		
Referenced Method	Isotope(s)	TestAmerica Richland's SOP No.
EPA 901.1	Cs-134, I-131	RL-GAM-001
EPA 900.0	Alpha & Beta	RL-GPC-001
EPA 00-02	Gross Alpha (Coprecipitation)	RL-GPC-002
EPA 903.0	Total Alpha Radium (Ra-226)	RL-RA-002
EPA 903.1	Ra-226	RL-RA-001
EPA 904.0	Ra-228	RL-RA-001
EPA 905.0	Sr-89/90	RL-GPC-003
ASTM D5174	Uranium	RL-KPA-003
EPA 906.0	Tritium	RL-LSC-005

Results in this report relate only to the sample(s) analyzed.

Uncertainty Estimation

TestAmerica Richland has adopted the internationally accepted approach to estimating uncertainties described in "NIST Technical Note 1297, 1994 Edition". The approach, "Law of Propagation of Errors", involves the identification of all variables in an analytical method which are used to derive a result. These variables are related to the analytical result (R) by some functional relationship, $R = \text{constants} * f(x,y,z,...)$. The components (x,y,z) are evaluated to determine their contribution to the overall method uncertainty. The individual component uncertainties (u_i) are then combined using a statistical model that provides the most probable overall uncertainty value. All component uncertainties are categorized as type A, evaluated by statistical methods, or type B, evaluated by other means. Uncertainties not included in the components, such as sample homogeneity, are combined with the component uncertainty as the square root of the sum-of-the-squares of the individual uncertainties. The uncertainty associated with the derived result is the combined uncertainty (u_c) multiplied by the coverage factor (1,2, or 3).

When three or more sample replicates are used to derive the analytical result, the type A uncertainty is the standard deviation of the mean value (S/\sqrt{n}), where S is the standard deviation of the derived results. The type B uncertainties are all other random or non-random components that are not included in the standard deviation.

The derivation of the general "Law of Propagation of Errors" equations and specific example are available on request.

Report Definitions

Action Lev	An agreed upon activity level used to trigger some action when the final result is greater than or equal to the Action Level. Often the Action Level is related to the Decision Limit.
Batch	The QC preparation batch number that relates laboratory samples to QC samples that were prepared and analyzed together.
Bias	Defined by the equation (Result/Expected)-1 as defined by ANSI N13.30.
COC No	Chain of Custody Number assigned by the Client or TestAmerica.
Count Error (#s)	Poisson counting statistics of the gross sample count and background. The uncertainty is absolute and in the same units as the result. For Liquid Scintillation Counting (LSC) the batch blank count is the background.
CSU (#s) <i>u_c Combined Standard Uncert.</i>	All known uncertainties associated with the preparation and analysis of the sample are propagated to give a measure of the uncertainty associated with the result, <i>u_c the combined standard uncertainty</i> . The uncertainty is absolute and in the same units as the result.
(#s), Coverage Factor	The coverage factor defines the width of the confidence interval, 1, 2 or 3 standard deviations.
CRDL (RL)	Contractual Required Detection Limit as defined in the Client's Statement Of Work or TestAmerica "default" nominal detection limit. Often referred to the reporting level (RL)
Lc	Decision Level based on instrument background or blank, adjusted by the Efficiency, Chemical Yield, and Volume associated with the sample. The Type I error probability is approximately 5%. Lc=(1.645 * Sqrt(2*(BkgrndCnt/BkgrndCntMin)/SCntMin)) * (ConvFct/(Eff*Yld*Abn*Vol) * IngrFct). For LSC methods the batch blank is used as a measure of the background variability. Lc cannot be calculated when the background count is zero.
Lot-Sample No	The number assigned by the LIMS software to track samples received on the same day for a given client. The sample number is a sequential number assigned to each sample in the Lot.
MDC MDA MDL	Detection Level based on instrument background or blank, adjusted by the Efficiency, Chemical Yield, and Volume with a Type I and II error probability of approximately 5%. MDC = (4.65 * Sqrt((BkgrndCnt/BkgrndCntMin)/SCntMin) + 2.71/SCntMin) * (ConvFct/(Eff * Yld * Abn * Vol) * IngrFct). For LSC methods the batch blank is used as a measure of the background variability.
Primary Detector	The instrument identifier associated with the analysis of the sample aliquot.
Ratio U-234/U-238	The U-234 result divided by the U-238 result. The U-234/U-238 ratio for natural uranium in NIST SRM 4321C is 1.038.
Rst/MDC	Ratio of the Result to the MDC. A value greater than 1 may indicate activity above background at a high level of confidence. Caution should be used when applying this factor and it should be used in concert with the qualifiers associated with the result.
Rst/TotUcert	Ratio of the Result to the Total Uncertainty. If the uncertainty has a coverage factor of 2 a value greater than 1 may indicate activity above background at approximately the 95% level of confidence assuming a two-sided confidence interval. Caution should be used when applying this factor and it should be used in concert with the qualifiers associated with the result.
Report DB No	Sample Identifier used by the report system. The number is based upon the first five digits of the Work Order Number.
RER	The equation Replicate Error Ratio = (S-D)/[sqrt(TPUs ² + TPUD ²)] as defined by ICPT BOA where S is the original sample result, D is the result of the duplicate, TPUs is the total uncertainty of the original sample and TPUD is the total uncertainty of the duplicate sample.
SDG	Sample Delivery Group Number assigned by the Client or assigned by TestAmerica upon sample receipt.
Sum Rpt Alpha Spec Rst(s)	The sum of the reported alpha spec results for tests derived from the same sample excluding duplicate result where the results are in the same units.
Work Order	The LIMS software assign test specific identifier.
Yield	The recovery of the tracer added to the sample such as Pu-242 used to trace a Pu-239/40 method.

Sample Results Summary

Date: 04-Oct-16

TestAmerica Inc TA-RL

Ordered by Method, Batch No., Client Sample ID.

Report No. : 69444

SDG No: 51987

Batch	Client Id Work Order	Parameter	Result +/- CSU (2 s)		Qual	Units	Tracer Yield	MDL	CRDL	RER2
6237031 L4SO										
		YMTFA55C(160-18646-6)								
	M85TM1AE	PLUTONIUM-238	6.32E-03	+- 2.5E-02	U	PCI_G	91%	6.47E-02	1.00E+00	
		PLUTONIUM-239/240	-1.46E-03	+- 2.4E-02	U	PCI_G	91%	5.05E-02	1.00E+00	
		YMTFA56C(160-18646-5)								
	M85TL1AE	PLUTONIUM-238	-4.68E-03	+- 2.6E-02	U	PCI_G	84%	6.52E-02	1.00E+00	
		PLUTONIUM-239/240	-1.56E-03	+- 2.6E-02	U	PCI_G	84%	5.41E-02	1.00E+00	
		YMTFA57C(160-18646-4)								
	M85TK1AE	PLUTONIUM-238	1.04E-02	+- 2.9E-02	U	PCI_G	89%	6.91E-02	1.00E+00	
		PLUTONIUM-239/240	0.00E+00	+- 2.9E-02	U	PCI_G	89%	5.31E-02	1.00E+00	
		YMTFA58C(160-18646-3)								
	M85TJ1AE	PLUTONIUM-238	3.10E-02	+- 4.2E-02	U	PCI_G	96%	6.10E-02	1.00E+00	
		PLUTONIUM-239/240	1.05E-02	+- 2.4E-02	U	PCI_G	96%	4.95E-02	1.00E+00	
		YMTFA65C(160-18646-2)								
	M85TF1AE	PLUTONIUM-238	4.43E-02	+- 6.0E-02	U	PCI_G	86%	8.72E-02	1.00E+00	
		PLUTONIUM-239/240	1.50E-02	+- 3.4E-02	U	PCI_G	86%	7.08E-02	1.00E+00	
		YMTFA72C(160-18646-1)								
	M85R91AE	PLUTONIUM-238	-7.21E-03	+- 2.8E-02	U	PCI_G	88%	7.52E-02	1.00E+00	
		PLUTONIUM-239/240	-5.54E-04	+- 2.8E-02	U	PCI_G	88%	5.09E-02	1.00E+00	
		YMTFA72C(160-18646-1) DUP								
	M85R91AH	PLUTONIUM-238	7.97E-03	+- 2.1E-02	U	PCI_G	92%	4.87E-02	1.00E+00	0.9
		PLUTONIUM-239/240	-4.19E-03	+- 2.1E-02	U	PCI_G	92%	5.37E-02	1.00E+00	0.2
6237032 C0SR										
		YMTFA55C(160-18646-6)								
	M85TM1AG	URANIUM-233/234	1.80E-01	+- 8.0E-02		PCI_G	99%	5.56E-02	1.00E+00	
		URANIUM-235/236	1.78E-02	+- 2.4E-02	U	PCI_G	99%	3.64E-02	1.00E+00	
		URANIUM-238	2.09E-01	+- 8.8E-02		PCI_G	99%	6.17E-02	1.00E+00	
		YMTFA56C(160-18646-5)								
	M85TL1AG	URANIUM-233/234	1.54E-01	+- 9.4E-02		PCI_G	92%	5.64E-02	1.00E+00	
		URANIUM-235/236	1.14E-02	+- 2.6E-02	U	PCI_G	92%	5.41E-02	1.00E+00	
		URANIUM-238	9.10E-02	+- 7.1E-02		PCI_G	92%	4.77E-02	1.00E+00	
		YMTFA57C(160-18646-4)								
	M85TK1AG	URANIUM-233/234	1.27E-01	+- 8.6E-02		PCI_G	86%	6.23E-02	1.00E+00	
		URANIUM-235/236	1.25E-02	+- 2.6E-02	U	PCI_G	86%	4.79E-02	1.00E+00	
		URANIUM-238	7.72E-02	+- 6.5E-02		PCI_G	86%	5.15E-02	1.00E+00	
		YMTFA58C(160-18646-3)								
	M85TJ1AG	URANIUM-233/234	2.53E-01	+- 1.3E-01		PCI_G	83%	5.48E-02	1.00E+00	
		URANIUM-235/236	-5.97E-04	+- 3.0E-02	U	PCI_G	83%	5.48E-02	1.00E+00	
		URANIUM-238	2.09E-01	+- 1.2E-01		PCI_G	83%	5.48E-02	1.00E+00	

TestAmerica Inc	RER2 - Replicate Error Ratio = $(S-D)/[\sqrt{(sq(TPUs)+sq(TPUs))}]$ as defined by ICPT BOA.
rptTALRchSaSum mary2 V5.7.1 A2002	U Qual - Analyzed for but not detected above limiting criteria, Mdc/Mda/Mdl, Total Uncert, RDL or not identified by gamma scan software.

Sample Results Summary

Date: 04-Oct-16

TestAmerica Inc TA-RL

Ordered by Method, Batch No., Client Sample ID.

Report No. : 69444

SDG No: 51987

Batch	Client Id Work Order	Parameter	Result +/- CSU (2 s)		Qual	Units	Tracer Yield	MDL	CRDL	RER2		
6237032 C0SR												
YMTFA65C(160-18646-2)												
M85TF1AG	URANIUM-233/234		1.30E-01	+- 9.2E-02		PCI_G	87%	9.57E-02	1.00E+00			
	URANIUM-235/236		1.58E-02	+- 4.5E-02	U	PCI_G	87%	9.51E-02	1.00E+00			
	URANIUM-238		1.97E-01	+- 1.4E-01		PCI_G	87%	1.90E-01	1.00E+00			
YMTFA72C(160-18646-1)												
M85R91AG	URANIUM-233/234		1.90E-01	+- 9.3E-02		PCI_G	97%	5.27E-02	1.00E+00			
	URANIUM-235/236		8.95E-03	+- 2.0E-02	U	PCI_G	97%	3.84E-02	1.00E+00			
	URANIUM-238		1.08E-01	+- 7.0E-02		PCI_G	97%	6.05E-02	1.00E+00			
YMTFA72C(160-18646-1) DUP												
M85R91AJ	URANIUM-233/234		2.07E-01	+- 1.1E-01		PCI_G	95%	8.52E-02	1.00E+00	0.3		
	URANIUM-235/236		-3.50E-03	+- 2.2E-02	U	PCI_G	95%	5.36E-02	1.00E+00	0.8		
	URANIUM-238		2.11E-01	+- 1.1E-01		PCI_G	95%	9.33E-02	1.00E+00	1.6		
6237033 L4SX												
YMTFA55C(160-18646-6)												
M85TM1AC	AMERICIUM-241		5.04E-03	+- 2.8E-02	U	PCI_G	81%	7.96E-02	1.00E+00			
YMTFA56C(160-18646-5)												
M85TL1AC	AMERICIUM-241		5.45E-03	+- 2.3E-02	U	PCI_G	109%	6.15E-02	1.00E+00			
YMTFA57C(160-18646-4)												
M85TK1AC	AMERICIUM-241		1.97E-02	+- 3.8E-02	U	PCI_G	97%	7.20E-02	1.00E+00			
YMTFA58C(160-18646-3)												
M85TJ1AC	AMERICIUM-241		3.45E-02	+- 4.6E-02	U	PCI_G	89%	6.55E-02	1.00E+00			
YMTFA65C(160-18646-2)												
M85TF1AC	AMERICIUM-241		-3.58E-03	+- 3.6E-02	U	PCI_G	82%	8.05E-02	1.00E+00			
YMTFA72C(160-18646-1)												
M85R91AC	AMERICIUM-241		3.07E-02	+- 4.3E-02	U	PCI_G	100%	6.49E-02	1.00E+00			
YMTFA72C(160-18646-1) DUP												
M85R91AK	AMERICIUM-241		1.84E-02	+- 2.9E-02	U	PCI_G	94%	4.60E-02	1.00E+00	0.5		
6237034 L4S1												
YMTFA55C(160-18646-6)												
M85TM1AF	THORIUM-228		1.26E-01	+- 8.3E-02		PCI_G	86%	5.32E-02	1.00E+00			
	THORIUM-230		1.59E-01	+- 9.2E-02		PCI_G	86%	4.49E-02	1.00E+00			
	THORIUM-232		2.45E-01	+- 1.2E-01		PCI_G	86%	4.49E-02	1.00E+00			
YMTFA56C(160-18646-5)												
M85TL1AF	THORIUM-228		1.10E-01	+- 8.4E-02		PCI_G	90%	5.75E-02	1.00E+00			
	THORIUM-230		1.35E-01	+- 9.2E-02		PCI_G	90%	5.49E-02	1.00E+00			
	THORIUM-232		1.79E-01	+- 1.1E-01		PCI_G	90%	5.49E-02	1.00E+00			
YMTFA57C(160-18646-4)												
M85TK1AF	THORIUM-228		1.16E-01	+- 8.1E-02		PCI_G	92%	5.93E-02	1.00E+00			

TestAmerica Inc RER2 - Replicate Error Ratio = $(S-D)/[\sqrt{(sq(TPUs)+sq(TPUs))}]$ as defined by ICPT BOA.
 rptTALRchSaSum U Qual - Analyzed for but not detected above limiting criteria, Mdc/Mda/Mdl, Total Uncert, RDL or not identified by gamma scan
 mary2 V5.7.1 software.
 A2002

Sample Results Summary

Date: 04-Oct-16

TestAmerica Inc TA-RL

Ordered by Method, Batch No., Client Sample ID.

Report No. : 69444

SDG No: 51987

Batch	Client Id Work Order	Parameter	Result +/- CSU (2 s)		Qual	Units	Tracer Yield	MDL	CRDL	RER2		
6237034 L4S1												
YMTFA57C(160-18646-4)												
M85TK1AF	THORIUM-230		9.83E-02	+- 7.3E-02		PCI_G	92%	5.67E-02	1.00E+00			
	THORIUM-232		2.01E-01	+- 1.1E-01		PCI_G	92%	4.98E-02	1.00E+00			
YMTFA58C(160-18646-3)												
M85TJ1AF	THORIUM-228		1.95E-01	+- 1.1E-01		PCI_G	85%	5.13E-02	1.00E+00			
	THORIUM-230		1.87E-01	+- 1.0E-01		PCI_G	85%	4.91E-02	1.00E+00			
	THORIUM-232		2.41E-01	+- 1.2E-01		PCI_G	85%	4.91E-02	1.00E+00			
YMTFA65C(160-18646-2)												
M85TF1AF	THORIUM-228		6.87E-02	+- 7.3E-02	U	PCI_G	83%	8.14E-02	1.00E+00			
	THORIUM-230		1.02E-01	+- 8.6E-02		PCI_G	83%	7.20E-02	1.00E+00			
	THORIUM-232		3.46E-02	+- 4.9E-02	U	PCI_G	83%	6.35E-02	1.00E+00			
YMTFA72C(160-18646-1)												
M85R91AF	THORIUM-228		1.66E-01	+- 9.0E-02		PCI_G	91%	4.40E-02	1.00E+00			
	THORIUM-230		7.41E-02	+- 5.7E-02		PCI_G	91%	3.91E-02	1.00E+00			
	THORIUM-232		1.17E-01	+- 7.3E-02		PCI_G	91%	3.91E-02	1.00E+00			
YMTFA72C(160-18646-1) DUP												
M85R91AL	THORIUM-228		1.18E-01	+- 7.0E-02		PCI_G	89%	4.57E-02	1.00E+00	0.8		
	THORIUM-230		2.15E-01	+- 9.7E-02		PCI_G	89%	6.87E-02	1.00E+00	2.5		
	THORIUM-232		7.07E-02	+- 5.2E-02		PCI_G	89%	3.53E-02	1.00E+00	1.0		
6237036 E7XW												
YMTFA55C(160-18646-6)												
M85TM1AD	NEPTUNIUM-237		-1.01E-03	+- 2.5E-02	U	PCI_G	75%	4.97E-02	1.00E+00			
YMTFA56C(160-18646-5)												
M85TL1AD	NEPTUNIUM-237		0.00E+00	+- 2.7E-02	U	PCI_G	91%	5.02E-02	1.00E+00			
YMTFA57C(160-18646-4)												
M85TK1AD	NEPTUNIUM-237		-1.31E-03	+- 2.2E-02	U	PCI_G	91%	4.53E-02	1.00E+00			
YMTFA58C(160-18646-3)												
M85TJ1AD	NEPTUNIUM-237		1.10E-02	+- 2.5E-02	U	PCI_G	89%	5.19E-02	1.00E+00			
YMTFA65C(160-18646-2)												
M85TF1AD	NEPTUNIUM-237		-1.25E-03	+- 3.1E-02	U	PCI_G	79%	6.15E-02	1.00E+00			
YMTFA72C(160-18646-1)												
M85R91AD	NEPTUNIUM-237		-1.17E-03	+- 2.9E-02	U	PCI_G	84%	5.79E-02	1.00E+00			
YMTFA72C(160-18646-1) DUP												
M85R91AN	NEPTUNIUM-237		-4.21E-04	+- 2.1E-02	U	PCI_G	91%	3.87E-02	1.00E+00	0.0		
6237035 RL-LSC-008												
YMTFA55C(160-18646-6)												
M85TM1AA	CARBON-14		-4.89E-02	+- 2.1E-01	U	PCI_G	100%	4.82E-01	1.00E+01			
YMTFA56C(160-18646-5)												

TestAmerica Inc RER2 - Replicate Error Ratio = $(S-D)/[\sqrt{(sq(TPUs)+sq(TPUs))}]$ as defined by ICPT BOA.
rptTALRchSaSum U Qual - Analyzed for but not detected above limiting criteria, Mdc/Mda/Mdl, Total Uncert, RDL or not identified by gamma scan
mary2 V5.7.1 software.
A2002

Sample Results Summary

Date: 04-Oct-16

TestAmerica Inc TA-RL

Ordered by Method, Batch No., Client Sample ID.

Report No. : 69444

SDG No: 51987

Batch	Client Id Work Order	Parameter	Result +- CSU (2 s)		Qual	Units	Tracer Yield	MDL	CRDL	RER2
6237035 RL-LSC-008										
	YMTFA56C(160-18646-5) M85TL1AA CARBON-14		-5.69E-02	+- 2.1E-01	U	PCI_G	100%	4.77E-01	1.00E+01	
	YMTFA57C(160-18646-4) M85TK1AA CARBON-14		-2.59E-01	+- 2.0E-01	U	PCI_G	100%	4.73E-01	1.00E+01	
	YMTFA58C(160-18646-3) M85TJ1AA CARBON-14		-1.20E-01	+- 2.0E-01	U	PCI_G	100%	4.69E-01	1.00E+01	
	YMTFA65C(160-18646-2) M85TF1AA CARBON-14		-9.07E-02	+- 2.0E-01	U	PCI_G	100%	4.48E-01	1.00E+01	
	YMTFA65C(160-18646-2) DUP M85TF1AH CARBON-14		-2.15E-02	+- 2.1E-01	U	PCI_G	100%	4.57E-01	1.00E+01	0.5
	YMTFA72C(160-18646-1) M85R91AA CARBON-14		-6.95E-02	+- 2.1E-01	U	PCI_G	100%	4.66E-01	1.00E+01	
	No. of Results: 77									

QC Results Summary

Date: 04-Oct-16

TestAmerica Inc TA-RL

Ordered by Method, Batch No, QC Type,.

Report No. : 69444

SDG No.: 51987

Batch	Work Order	Parameter	Result +- CSU (2 s)	Qual	Units	Tracer Yield	LCS Recovery	Bias	MDL
L4SO									
6237031	BLANK QC,								
M85VD1AA	PLUTONIUM-238		-3.97E-03 +- 3.3E-02	U	PCI_G	79%		7.68E-02	
	PLUTONIUM-239/240		1.19E-02 +- 3.3E-02	U	PCI_G	79%		7.89E-02	
6237031	LCS,								
M85VD1AC	PLUTONIUM-239/240		3.48E+00 +- 7.5E-01		PCI_G	84%	108%	0.1	5.28E-02
C0SR									
6237032	BLANK QC,								
M85VF1AA	URANIUM-233/234		-6.15E-04 +- 3.1E-02	U	PCI_G	68%		5.64E-02	
	URANIUM-235/236		-6.15E-04 +- 3.1E-02	U	PCI_G	68%		5.64E-02	
	URANIUM-238		4.49E-02 +- 5.4E-02	U	PCI_G	68%		6.07E-02	
6237032	LCS,								
M85VF1AC	URANIUM-233/234		3.05E+00 +- 6.9E-01		PCI_G	86%	94%	-0.1	5.88E-02
	URANIUM-238		2.89E+00 +- 6.6E-01		PCI_G	86%	85%	-0.2	5.88E-02
L4SX									
6237033	BLANK QC,								
M85VG1AA	AMERICIUM-241		8.15E-03 +- 3.2E-02	U	PCI_G	84%		8.34E-02	
6237033	LCS,								
M85VG1AC	AMERICIUM-241		3.33E+00 +- 7.4E-01		PCI_G	79%	104%	0.0	5.55E-02
L4S1									
6237034	BLANK QC,								
M85VH1AA	THORIUM-228		2.67E-02 +- 4.0E-02	U	PCI_G	84%		5.90E-02	
	THORIUM-230		5.37E-02 +- 5.5E-02		PCI_G	84%		4.98E-02	
	THORIUM-232		0.00E+00 +- 2.7E-02	U	PCI_G	84%		4.98E-02	
6237034	LCS,								
M85VH1AC	THORIUM-230		1.63E+00 +- 3.7E-01		PCI_G	88%	101%	0.0	4.71E-02
E7XW									
6237036	BLANK QC,								
M85VK1AA	NEPTUNIUM-237		-6.54E-04 +- 3.3E-02	U	PCI_G	76%		6.00E-02	
6237036	LCS,								
M85VK2AC	NEPTUNIUM-237		1.24E+00 +- 4.1E-01		PCI_G	87%	90%	-0.1	4.82E-02
RL-LSC-008									
6237035	BLANK QC,								
M85VJ1AA	CARBON-14		-9.66E-02 +- 2.1E-01	U	PCI_G	100%			4.81E-01
6237035	LCS,								
M85VJ1AC	CARBON-14		7.77E+00 +- 5.9E-01		PCI_G	100%	107%	0.1	4.79E-01
No. of Results: 18									

TestAmerica Inc Bias - (Result/Expected)-1 as defined by ANSI N13.30.

rptSTLRchQcSum U Qual - Analyzed for but not detected above limiting criteria, Mdc/Mda/Mdl, Total Uncert, RDL or not identified by gamma scan software.
mary V5.7.1 A2002

FORM I
SAMPLE RESULTS

Date: 04-Oct-16

Lab Name: TestAmerica Inc
Lot-Sample No.: J6H240415-6
Client Sample ID: YMTFA55C(160-18646-6)

Parameter	Result	Qual	Count Error (2 s)	CSU (2 s)	MDL, Action Lev	Rpt Unit, Lc	Yield CRDL(RL)	Rst/MDL, Rst/TotUncert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Primary Detector
Batch: 6237031	L4SO			Work Order: M85TM1AE	Report DB ID: 9M85TM10							
PLUTONIUM-238	6.32E-03	U		2.5E-02	6.47E-02	PCL_G	91%	0.1	9/29/16 05:32 p			1.32 ALP423
PLUTONIUM-239/240	-1.46E-03	U		2.4E-02	5.05E-02	PCL_G	91%	0.51				g
						1.14E-02	1.00E+00	-0.12	9/29/16 05:32 p			1.32 ALP423
												g
Batch: 6237032	C0SR			Work Order: M85TM1AG	Report DB ID: 9M85TM10							
URANIUM-233/234	1.80E-01			8.0E-02	5.56E-02	PCL_G	99%	(3.2)	9/21/16 07:30 p			1.71 ALP11
URANIUM-235/236	1.78E-02	U		2.4E-02	3.64E-02	PCL_G	99%	1.00E+00	(4.5)			g
URANIUM-238	2.09E-01			8.8E-02	6.17E-02	PCL_G	99%	1.00E+00	(1.5)			1.71 ALP11
						2.27E-02	1.00E+00	(4.8)	9/21/16 07:30 p			g
Batch: 6237033	L4SX			Work Order: M85TM1AC	Report DB ID: 9M85TM10							
AMERICIUM-241	5.04E-03	U		2.8E-02	7.96E-02	PCL_G	81%	0.06	9/30/16 05:56 p			1.32 ALP426
						2.35E-02	1.00E+00	0.36				g
Batch: 6237034	L4S1			Work Order: M85TM1AF	Report DB ID: 9M85TM10							
THORIUM-228	1.26E-01			8.3E-02	5.32E-02	PCL_G	86%	(2.4)	9/29/16 07:30 p			1.32 ALP131
THORIUM-230	1.59E-01			9.2E-02	4.49E-02	PCL_G	86%	1.00E+00	(3.)			g
						8.76E-03	1.00E+00	(3.5)	9/29/16 07:30 p			1.32 ALP131
												g

FORM I
SAMPLE RESULTS

Date: 04-Oct-16

Lab Name: TestAmerica Inc
 Lot-Sample No.: J6H240415-6
 Client Sample ID: YMTFA55C(160-18646-6)

Parameter	Result	Qual	Count Error (2 s)	CSU (2 s)	MDL, Action Lev	Rpt Unit, Lc	Yield CRDL(RL)	Rst/MDL, Rst/TotUncert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Primary Detector
THORIUM-232	2.45E-01			1.2E-01	4.49E-02	PCL_G	86%	(5.4)	9/29/16 07:30 p		1.32	ALP131
					8.76E-03	1.00E+00		(4.2)			g	
Batch: 6237035 CARBON-14	RL-LSC-008 -4.89E-02	U	1.9E-01	2.1E-01	4.82E-01	PCL_G	100%	-0.1	Report DB ID: 9M85TM10 10/4/16 01:48 a	5.0	LSC9	
					2.26E-01	1.00E+01		-0.46			g	
Batch: 6237036 NEPTUNIUM-237	E7XW -1.01E-03	U	2.5E-02	2.5E-02	4.97E-02	PCL_G	75%	-0.02	Report DB ID: 9M85TM10 9/15/16 10:42 a	1.3	ALP114	
					1.06E-02	1.00E+00		-0.08			g	
No. of Results:	11	Comments:										

FORM I
SAMPLE RESULTS

Date: 04-Oct-16

Lab Name: TestAmerica Inc
Lot-Sample No.: J6H240415-5
Client Sample ID: YMTFA56C(160-18646-5)

Parameter	Result	Qual	Count Error (2 s)	CSU (2 s)	MDL, Action Lev	Rpt Unit Lc	Yield CRDL(RL)	Rst/MDL, Rst/TotUncert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Primary Detector
Batch: 6237031	L4SO			Work Order: M85TL1AE	Report DB ID: 9M85TL10							
PLUTONIUM-238	-4.68E-03	U		2.6E-02	6.52E-02	PCL_G	84%	-0.07	9/29/16 05:32 p			1.34 ALP422
PLUTONIUM-239/240	-1.56E-03	U		2.6E-02	5.41E-02	PCL_G	84%	-0.36				g
						1.22E-02	1.00E+00	-0.03	9/29/16 05:32 p			1.34 ALP422
								-0.12				g
Batch: 6237032	C0SR			Work Order: M85TL1AG	Report DB ID: 9M85TL10							
URANIUM-233/234	1.54E-01			9.4E-02	5.64E-02	PCL_G	92%	(2.7)	9/16/16 05:24 p			1.09 ALP412
URANIUM-235/236	1.14E-02	U		2.6E-02	5.41E-02	PCL_G	92%	1.00E+00	(3.3)			g
URANIUM-238	9.10E-02			7.1E-02	4.77E-02	PCL_G	92%	1.00E+00	0.21	9/16/16 05:24 p		1.09 ALP412
						1.22E-02	1.00E+00	0.88				g
								(1.9)	9/16/16 05:24 p			1.09 ALP412
								9.31E-03	1.00E+00			g
								(2.6)				
Batch: 6237033	L4SX			Work Order: M85TL1AC	Report DB ID: 9M85TL10							
AMERICIUM-241	5.45E-03	U		2.3E-02	6.15E-02	PCL_G	109%	0.09	9/30/16 05:56 p			1.34 ALP425
						1.76E-02	1.00E+00	0.47				g
Batch: 6237034	L4S1			Work Order: M85TL1AF	Report DB ID: 9M85TL10							
THORIUM-228	1.10E-01			8.4E-02	5.75E-02	PCL_G	90%	(1.9)	9/29/16 07:30 p			1.34 ALP130
THORIUM-230	1.35E-01			9.2E-02	5.49E-02	PCL_G	90%	1.00E+00	(2.6)			g
						1.07E-02	1.00E+00	(2.5)	9/29/16 07:30 p			1.34 ALP130
								(2.9)				g

FORM I
SAMPLE RESULTS

Date: 04-Oct-16

Lab Name: TestAmerica Inc
 Lot-Sample No.: J6H240415-5
 Client Sample ID: YMTFA56C(160-18646-5)

Parameter	Result	Qual	Count Error (2 s)	CSU (2 s)	MDL, Action Lev	Rpt Unit, Lc	Yield CRDL(RL)	Rst/MDL, Rst/TotUncert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Primary Detector
THORIUM-232	1.79E-01		1.1E-01	5.49E-02	PCL_G	90%	(3.3)	9/29/16 07:30 p		1.34	g	ALP130
Batch: 6237035 CARBON-14	RL-LSC-008 -5.69E-02	U	1.9E-01	2.1E-01	4.77E-01	PCL_G	100%	-0.12	10/4/16 01:26 a	5.0	g	LSC9
Batch: 6237036 NEPTUNIUM-237	E7XW 0.00E+00	U	0.0E+00	2.7E-02	5.02E-02	PCL_G	91%	0.	9/15/16 10:42 a	1.28	g	ALP112
No. of Results:	11	Comments:			9.80E-03	1.00E+00	0.					

FORM I
SAMPLE RESULTS

Date: 04-Oct-16

Lab Name: TestAmerica Inc
Lot-Sample No.: J6H240415-4
Client Sample ID: YMTFA57C(160-18646-4)

Parameter	Result	Qual	Count Error (2 s)	CSU (2 s)	MDL, Action Lev	Rpt Unit Lc	Yield CRDL(RL)	Rst/MDL, Rst/TotUncert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Primary Detector
Batch: 6237031	L4SO			Work Order: M85TK1AE	Report DB ID: 9M85TK10							
PLUTONIUM-238	1.04E-02	U		2.9E-02	6.91E-02	PCL_G	89%	0.15	9/29/16 05:31 p		1.09	ALP421
PLUTONIUM-239/240	0.00E+00	U		2.9E-02	5.31E-02	PCL_G	89%	0.	9/29/16 05:31 p		1.09	ALP421
Batch: 6237032	C0SR			Work Order: M85TK1AG	Report DB ID: 9M85TK10							
URANIUM-233/234	1.27E-01			8.6E-02	6.23E-02	PCL_G	86%	(2.)	9/16/16 05:23 p		1.16	ALP411
URANIUM-235/236	1.25E-02	U		2.6E-02	4.79E-02	PCL_G	86%	0.26	9/16/16 05:23 p		1.16	ALP411
URANIUM-238	7.72E-02			6.5E-02	5.15E-02	PCL_G	86%	(1.5)	9/16/16 05:23 p		1.16	ALP411
Batch: 6237033	L4SX			Work Order: M85TK1AC	Report DB ID: 9M85TK10							
AMERICIUM-241	1.97E-02	U		3.8E-02	7.20E-02	PCL_G	97%	0.27	9/30/16 05:55 p		1.09	ALP424
Batch: 6237034	L4S1			Work Order: M85TK1AF	Report DB ID: 9M85TK10							
THORIUM-228	1.16E-01			8.1E-02	5.93E-02	PCL_G	92%	(2.)	9/29/16 07:29 p		1.09	ALP129
THORIUM-230	9.83E-02			7.3E-02	5.67E-02	PCL_G	92%	(1.7)	9/29/16 07:29 p		1.09	ALP129
Batch: 6237035	L4S2			3.9E-02	2.06E-02	1.00E+00	(1.)					
THORIUM-228	1.16E-01			8.1E-02	5.93E-02	PCL_G	92%	(2.)	9/29/16 07:29 p		1.09	ALP129
THORIUM-230	9.83E-02			7.3E-02	5.67E-02	PCL_G	92%	(1.7)	9/29/16 07:29 p		1.09	ALP129

FORM I
SAMPLE RESULTS

Date: 04-Oct-16

Lab Name: TestAmerica Inc
 Lot-Sample No.: J6H240415-4
 Client Sample ID: YMTFA57C(160-18646-4)

Parameter	Result	Qual	Count Error (2 s)	CSU (2 s)	MDL, Action Lev	Rpt Unit, Lc	Yield CRDL(RL)	Rst/MDL, Rst/TotUncert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Primary Detector
THORIUM-232	2.01E-01			1.1E-01	4.98E-02	PCL_G	92%	(4.)	9/29/16 07:29 p		1.09	ALP129
					1.06E-02	1.00E+00	(3.8)				g	
Batch: 6237035 CARBON-14	RL-LSC-008 -2.59E-01	U	1.8E-01	2.0E-01	4.73E-01	PCL_G	100%	-0.55 -(2.6)	10/4/16 01:04 a		5.1	LSC9
Batch: 6237036 NEPTUNIUM-237	E7XW 1.31E-03	U	2.2E-02	2.2E-02	4.53E-02	PCL_G	91%	-0.03 -0.12	9/15/16 10:41 a		1.26	ALP111
No. of Results:	11	Comments:									g	

FORM I
SAMPLE RESULTS

Date: 04-Oct-16

Lab Name: TestAmerica Inc
Lot-Sample No.: J6H240415-3
Client Sample ID: YMTFA55C(160-18646-3)

Parameter	Result	Qual	Count Error (2 s)	CSU (2 s)	MDL, Action Lev	Rpt Unit, Lc	Yield CRDL(RL)	Rst/MDL, Rst/TotUncrt	Analysis, Prep Date	Total Sa Size	Aliquot Size	Primary Detector
Batch: 6237031	L4SO			Work Order: M85TJ1AE	Report DB ID: 9M85TJ10							
PLUTONIUM-238	3.10E-02	U		4.2E-02	6.10E-02	PCL_G	96%	0.51	9/29/16 05:30 p		1.26	ALP420
PLUTONIUM-239/240	1.05E-02	U		2.4E-02	4.95E-02	PCL_G	96%	0.21	9/29/16 05:30 p		1.26	ALP420
Batch: 6237032	C0SR			Work Order: M85TJ1AG	Report DB ID: 9M85TJ10							
URANIUM-233/234	2.53E-01			1.3E-01	5.48E-02	PCL_G	83%	(4.6)	9/16/16 05:23 p		1.08	ALP410
URANIUM-235/236	-5.97E-04	U		3.0E-02	5.48E-02	PCL_G	83%	-0.01	9/16/16 05:23 p		g	
URANIUM-238	2.09E-01			1.2E-01	5.48E-02	PCL_G	83%	-0.04	9/16/16 05:23 p		1.08	ALP410
Batch: 6237033	L4SX			Work Order: M85TJ1AC	Report DB ID: 9M85TJ10							
AMERICIUM-241	3.45E-02	U		4.6E-02	6.55E-02	PCL_G	89%	0.53	9/30/16 05:54 p		1.26	ALP423
THORIUM-228	1.95E-01			1.1E-01	5.13E-02	PCL_G	85%	(3.8)	9/29/16 07:29 p		1.26	ALP128
THORIUM-230	1.87E-01			1.0E-01	4.91E-02	PCL_G	85%	(3.8)	9/29/16 07:29 p		g	
Batch: 6237034	L4S1			Work Order: M85TJ1AF	Report DB ID: 9M85TJ10							
THORIUM-228				4.6E-02	6.55E-02	PCL_G	89%	(1.5)				
THORIUM-230				1.0E-01	4.91E-02	PCL_G	85%	(3.6)				
THORIUM-230				9.58E-03	1.00E+00		(3.8)					
THORIUM-230				9.58E-03	1.00E+00		(3.6)					

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TestAmerica Inc MDL|MDA,Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.
U Qual - Analyzed for but not detected above limiting criteria, MDL|MDA|Mdi, Total Uncert, RDL or not identified by gamma scan software.
10/4/2016 10:15:00 AM
OpSTLRchSample V5.7.1 A2002

FORM I
SAMPLE RESULTS

Date: 04-Oct-16

Lab Name: TestAmerica Inc
 Lot-Sample No.: J6H240415-3
 Client Sample ID: YMTFA58C(160-18646-3)

Parameter	Result	Qual	Count Error (2 s)	CSU (2 s)	MDL, Action Lev	Rpt Unit, Lc	Yield CRDL(RL)	Rst/MDL, Rst/TotUncert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Primary Detector
THORIUM-232	2.41E-01			1.2E-01	4.91E-02	PCL_G	85%	(4.9)	9/29/16 07:29 p		1.26	ALP128
					9.58E-03	1.00E+00	(4.1)			g		
Batch: 6237035 CARBON-14	RL-LSC-008 -1.20E-01	U	1.9E-01	2.0E-01	4.69E-01	PCL_G	100%	-0.26	10/4/16 12:42 a		5.1	LSC9
					2.19E-01	1.00E+01	(-1.2)			g		
Batch: 6237036 NEPTUNIUM-237	E7XW 1.10E-02	U	2.5E-02	2.5E-02	5.19E-02	PCL_G	89%	0.21	9/15/16 02:22 a		1.27	ALP424
					1.17E-02	1.00E+00	0.87			g		
No. of Results:	11	Comments:										

FORM I
SAMPLE RESULTS

Date: 04-Oct-16

Lab Name: TestAmerica Inc
Lot-Sample No.: J6H240415-2
Client Sample ID: YMTFA65C(160-18646-2)

Parameter	Result	Qual	Count Error (2 s)	CSU (2 s)	MDL, Action Lev	Rpt Unit, Lc	Yield CRDL(RL)	Rst/MDL, Rst/TotUncert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Primary Detector
Batch: 6237031	L4SO			Work Order: M85TF1AE	Report DB ID: 9M85TF10							
PLUTONIUM-238	4.43E-02	U	6.0E-02	8.72E-02	PCL_G	86%	0.51	9/29/16 05:30 p		1.0	g	ALP419
PLUTONIUM-239/240	1.50E-02	U	3.4E-02	7.08E-02	PCL_G	86%	0.21	9/29/16 05:30 p		1.0	g	ALP419
Batch: 6237032	C0SR			Work Order: M85TF1AG	Report DB ID: 9M85TF10							
URANIUM-233/234	1.30E-01		9.2E-02	9.57E-02	PCL_G	87%	(1.4)	9/16/16 05:22 p		1.03	g	ALP12
URANIUM-235/236	1.58E-02	U	4.5E-02	9.51E-02	PCL_G	87%	0.17	9/16/16 05:22 p		1.03	g	ALP12
URANIUM-238	1.97E-01		1.4E-01	1.90E-01	PCL_G	87%	(1.)	9/16/16 05:22 p		1.03	g	ALP12
Batch: 6237033	L4SX			Work Order: M85TF1AC	Report DB ID: 9M85TF10							
AMERICIUM-241	-3.58E-03	U	3.6E-02	8.05E-02	PCL_G	82%	-0.04	9/30/16 05:54 p		1.0	g	ALP422
Batch: 6237034	L4S1			Work Order: M85TF1AF	Report DB ID: 9M85TF10							
THORIUM-228	6.87E-02	U	7.3E-02	8.14E-02	PCL_G	83%	0.84	9/29/16 07:29 p		1.0	g	ALP127
THORIUM-230	1.02E-01		8.6E-02	7.20E-02	PCL_G	83%	(1.4)	9/29/16 07:29 p		1.0	g	ALP127

FORM I
SAMPLE RESULTS

Date: 04-Oct-16

Lab Name: TestAmerica Inc
 Lot-Sample No.: J6H240415-2
 Client Sample ID: YMTFA65C(160-18646-2)

			SDG:			Collection Date:		
			Report No. :			Received Date:		
			COC No. :			Matrix:		
Ordered by Client Sample ID, Batch No.								
Parameter	Result	Qual	Count Error (2 s)	CSU (2 s)	MDL, Action Lev	Rpt Unit, CRDL(RL)	Yield PCL_G	Rst/MDL, Rst/TotUncert
THORIUM-232	3.46E-02	U	4.9E-02	6.35E-02	PCL_G	1.24E-02	83%	0.54 (1.4)
Batch: 6237035	RL-LSC-008		Work Order: M85TF1AA		Report DB ID: 9M85TF10		9/29/16 07:29 p	
CARBON-14	-9.07E-02	U	1.8E-01	2.0E-01	4.48E-01	PCL_G	100%	-0.2
					2.10E-01	1.00E+01	-0.9	
Batch: 6237036	E7XW		Work Order: M85TF1AD		Report DB ID: 9M85TF10		10/3/16 11:58 p	
NEPTUNIUM-237	1.25E-03	U	3.1E-02	3.1E-02	6.15E-02	PCL_G	79%	-0.02
					1.31E-02	1.00E+00	-0.08	
No. of Results:	11	Comments:						

FORM I
SAMPLE RESULTS

Date: 04-Oct-16

Lab Name: TestAmerica Inc
Lot-Sample No.: J6H240415-1
Client Sample ID: YMTFA72C(160-18646-1)

Parameter	Result	Qual	Count Error (2 s)	CSU (2 s)	MDL, Action Lev	Rpt Unit, Lc	Yield CRDL(RL)	Rst/MDL, Rst/TotUncrt	Analysis, Prep Date	Total Sa Size	Aliquot Size	Primary Detector
Batch: 6237031	L4SO			Work Order: M85R91AE	Report DB ID: 9M85R910							
PLUTONIUM-238	-7.21E-03	U	2.8E-02	7.52E-02	PCL_G	88%	-0.1	9/29/16 05:28 p		1.25	g	ALP413
PLUTONIUM-239/240	-5.54E-04	U	2.8E-02	5.09E-02	PCL_G	88%	-0.01	9/29/16 05:28 p		1.25	g	ALP413
Batch: 6237032	C0SR			Work Order: M85R91AG	Report DB ID: 9M85R910							
URANIUM-233/234	1.90E-01		9.3E-02	5.27E-02	PCL_G	97%	(3.6)	9/16/16 05:22 p		1.15	g	ALP6
URANIUM-235/236	8.95E-03	U	2.0E-02	3.84E-02	PCL_G	97%	1.00E+00	(4.1)		1.15	g	ALP6
URANIUM-238	1.08E-01		7.0E-02	6.05E-02	PCL_G	97%	1.00E+00	0.92	9/16/16 05:22 p	1.15	g	ALP6
Batch: 6237033	L4SX			Work Order: M85R91AC	Report DB ID: 9M85R910							
AMERICIUM-241	3.07E-02	U	4.3E-02	6.49E-02	PCL_G	100%	0.47	9/30/16 05:53 p		1.25	g	ALP413
Batch: 6237034	L4S1			Work Order: M85R91AF	Report DB ID: 9M85R910							
THORIUM-228	1.66E-01		9.0E-02	4.40E-02	PCL_G	91%	(3.8)	9/29/16 07:28 p		1.25	g	ALP116
THORIUM-230	7.41E-02		5.7E-02	3.91E-02	PCL_G	91%	1.00E+00	(3.7)	9/29/16 07:28 p	1.25	g	ALP116
Batch: 6237035	L4S2			Work Order: M85R91BI	Report DB ID: 9M85R910							
AMERICIUM-242	3.07E-02	U	4.3E-02	6.49E-02	PCL_G	100%	0.47	9/30/16 05:53 p		1.25	g	ALP413
Batch: 6237036	L4S3			Work Order: M85R91BII	Report DB ID: 9M85R910							
AMERICIUM-243	3.07E-02	U	4.3E-02	6.49E-02	PCL_G	100%	0.47	9/30/16 05:53 p		1.25	g	ALP413

FORM I
SAMPLE RESULTS

Date: 04-Oct-16

Lab Name: TestAmerica Inc
Lot-Sample No.: J6H240415-1
Client Sample ID: YMTFA72C(160-18646-1)

Parameter	Result	Qual	Count Error (2 s)	CSU (2 s)	MDL, Action Lev	Rpt Unit, Lc	Yield CRDL(RL)	Rst/MDL, Rst/TotUncert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Primary Detector
THORIUM-232	1.17E-01			7.3E-02	3.91E-02	PCL_G	91%	(3.)	9/29/16 07:28 p		1.25	ALP116
						7.63E-03	1.00E+00	(3.2)			g	
Batch: 6237035 CARBON-14	RL-LSC-008 -6.95E-02	U	1.9E-01	2.1E-01	4.66E-01	PCL_G	100%	-0.15	10/3/16 11:36 p		5.0	LSC9
						2.18E-01	1.00E+01	-0.67			g	
Batch: 6237036 NEPTUNIUM-237	E7XW -1.17E-03	U	2.9E-02	2.9E-02	5.79E-02	PCL_G	84%	-0.02	9/15/16 02:20 a		1.19	ALP419
						1.23E-02	1.00E+00	-0.08			g	
No. of Results:	11	Comments:										

FORM II

DUPLICATE RESULTS

Date: 04-Oct-16

Lab Name: TestAmerica Inc
 Lot-Sample No.: J6H240415-2
 Client Sample ID: YMTFA65C(160-18646-2) DUP

Parameter	Result, Orig Rst	Count Qual	CSU (2 s)	Rpt Unit, MDL-, Action Lev	Rst/MDL, Rst/TotUncert	Total Sa Size	Aliquot Size	Primary Detector
Batch:				Rpt Unit, CRDL	Yield			
6237035	RL-LSC-008			Work Order: M85TF1AH	Report DB ID: M85TF1HR	Orig Sa DB ID: 9M85TF10		
CARBON-14	-2.15E-02 -9.07E-02	U U	1.9E-01 RER2 0.5	2.1E-01 4.57E-01 1.00E+01	PCI_G 100%	-0.05 -0.21	10/4/16 12:20 a 10/4/16 12:20 a	5.0 g

No. of Results: 1 Comments:

TestAmerica Inc RER2 - Replicate Error Ratio = $\frac{(S-D)}{\sqrt{(\text{sq}(TPUs)+\text{sq}(TPUs))}}$ as defined by ICPT BOA.
 MDC|MDA,Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.
 rptSTLRchDupV5. U Qual - Analyzed for but not detected above limiting criteria, Mdc/Mda/Mdl, Total Uncert, RDL or not identified by gamma scan software.

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
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FORM II

Date: 04-Oct-16

DUPLICATE RESULTS

Lab Name: TestAmerica Inc
Lot-Sample No.: J6H240415-1
Client Sample ID: YMTFA72C(160-18646-1) DUP

SDG: 51987
Report No. : 69444
COC No. :

Parameter	Result, Orig Rst	Qual	Count Error (2 s)	CSU (2 s)	MDL, Action Lev	Rpt Unit, CRDL	Rst/MDL, Rst/TotUncrt	Analysis, Prep Date	Total Sa Size	Aliquot Size	Primary Detector
Batch: 6237031	L4SO			Work Order: M85R91AH		Report DB ID: M85R91HR		Orig Sa DB ID: 9M85R910			
PLUTONIUM-238	7.97E-03	U	2.1E-02	4.87E-02	PCI_G	92%	0.16	9/29/16 05:29 p		1.53	ALP414
	-7.21E-03	U	RER2 0.9	1.00E+00			0.75		g		
PLUTONIUM-239/240	-4.19E-03	U	2.1E-02	5.37E-02	PCI_G	92%	-0.08	9/29/16 05:29 p		1.53	ALP414
	-5.54E-04	U	RER2 0.2	1.00E+00			-0.4		g		
<i>Alpha Spec Result Sum = 3.8E-03</i>											
Page Batch: 6237032	C0SR			Work Order: M85R91AJ		Report DB ID: M85R91JR		Orig Sa DB ID: 9M85R910			
URANIUM-233/234	2.07E-01		1.1E-01	8.52E-02	PCI_G	95%	(2.4)	9/16/16 05:22 p		1.14	ALP11
	1.90E-01		RER2 0.3	1.00E+00			(3.9)		g		
URANIUM-235/236	-3.50E-03	U	2.2E-02	5.36E-02	PCI_G	95%	-0.07	9/16/16 05:22 p		1.14	ALP11
	8.95E-03	U	RER2 0.8	1.00E+00			-0.32		g		
URANIUM-238	2.11E-01		1.1E-01	9.33E-02	PCI_G	95%	(2.3)	9/16/16 05:22 p		1.14	ALP11
	1.08E-01		RER2 1.6	1.00E+00			(3.9)		g		
<i>Ratio U-234/238 = 1.0</i>											
Batch: 6237033	L4SX			Work Order: M85R91AK		Report DB ID: M85R91KR		Orig Sa DB ID: 9M85R910			
AMERICIUM-241	1.84E-02	U	2.9E-02	4.60E-02	PCI_G	94%	0.4	9/30/16 05:53 p		1.53	ALP414
	3.07E-02	U	RER2 0.5	1.00E+00			(1.3)		g		
<i>Alpha Spec Result Sum = 4.2E-01</i>											
Batch: 6237034	L4S1			Work Order: M85R91AL		Report DB ID: M85R91LR		Orig Sa DB ID: 9M85R910			
THORIUM-228	1.18E-01		7.0E-02	4.57E-02	PCI_G	89%	(2.6)	9/29/16 07:28 p		1.53	ALP118
	1.66E-01		RER2 0.8	1.00E+00			(3.4)		g		
<i>Alpha Spec Result Sum = 4.4E-01</i>											
TestAmerica Inc	RER2	-	Replicate Error Ratio = $(S-D)/[\sqrt{sq(TPU_s)+sq(TPU_d)}]$ as defined by ICPT BOA.								
10/4/2016	PrfSTLrChDUpV5	MDC/MDA,Lc	- Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.								
2017-A2002	U	Qual - Analyzed for but not detected above limiting criteria, Mdc/Mda/Mdl, Total Uncert, RDL or not identified by gamma scan software.									

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
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FORM II

Date: 04-Oct-16

DUPLICATE RESULTS

Lab Name: TestAmerica Inc
Lot-Sample No.: J6H240415-1
Client Sample ID: YMTFA72C(160-18646-1) DUP

Parameter	Result, Orig Rst	Count Qual	CSU (2 s)	Rpt Unit, MDL, Action Lev	Rpt Unit, CRDL	Yield	Rst/MDL, Rst/TotUncert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Primary Detector
THORIUM-230	2.15E-01	9.7E-02	6.87E-02	PCI_G	89%	(3.1)	9/29/16 07:28 p		1.53		ALP118
	7.41E-02	RER2 2.5	1.00E+00		(4.4)				g		
THORIUM-232	7.07E-02	5.2E-02	3.53E-02	PCI_G	89%	(2.)	9/29/16 07:28 p		1.53		ALP118
	1.17E-01	RER2 1.0	1.00E+00		(2.7)				g		
Alpha Spec Result Sum = 2.9E-01											
Batch: 6237036											
NEPTUNIUM-237											
Work Order: M85R91AN											
Report DB ID: M85R91NR											
Orig Sa DB ID: 9M85R910											
9/15/16 02:20 a											
Report ID: M85R91NR											
9/15/16 02:20 a											
Alpha Spec Result Sum = 2.8E-01											
No. of Results:	10	Comments:									

FORM II

BLANK RESULTS

Date: 04-Oct-16

Lab Name: TestAmerica Inc

Matrix: SOLID

SDG: 51987

Report No.: 69444

Parameter	Result	Count Error (2 s)	CSU (2 s)	MDL, Lc	Rpt Unit, CRDL	Yield	Rst/MDL, Rst/TotUncert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Primary Detector	
Batch: 6237035	RL-LSC-008	2.1E-01	4.81E-01	PCI_G	100%	-0.2	10/4/16 02:26 p		5.1	9	LSC9	
CARBON-14	-9.66E-02	U	1.9E-01	2.25E-01	1.00E+01	-0.93						
Batch: 6237032	C0SR	3.1E-02	5.64E-02	PCI_G	68%	-0.01	9/16/16 05:27 p		1.25	9	ALP429	
URANIUM-233/234	-6.15E-04	U	1.10E-02	1.00E+00		-0.04						
URANIUM-235/236	-6.15E-04	U	3.11E-02	5.64E-02	PCI_G	68%	-0.01	9/16/16 05:27 p		1.25	9	ALP429
URANIUM-238	4.49E-02	U	5.4E-02	6.07E-02	PCI_G	68%	-0.04					
				1.29E-02	1.00E+00	0.74	9/16/16 05:27 p		1.25	9	ALP429	
						(1.7)						
							Ratio U-234/U-238 = 0.0					
Batch: 6237036	E7XN	3.3E-02	6.00E-02	PCI_G	76%	-0.01	9/15/16 10:44 a		1.27	9	ALP119	
NEPTUNIUM-237	-6.54E-04	U	1.17E-02	1.00E+00		-0.04						
Batch: 6237034	L4S1	4.0E-02	5.90E-02	PCI_G	84%	0.45	9/29/16 08:58 p		1.09	9	ALP25	
THORIUM-228	2.67E-02	U	1.33E-02	1.00E+00		(1.3)						
THORIUM-230	5.37E-02		5.5E-02	4.98E-02	PCI_G	84%	(1.1)	9/29/16 08:58 p		1.09	9	ALP25
THORIUM-232	0.00E+00	U	2.71E-02	9.71E-03	1.00E+00		(2.)					
				9.71E-03	1.00E+00	84%	0.	9/29/16 08:58 p		1.09	9	ALP25
						0.						
Batch: 6237031	L4SO							Report DB ID: M85VD1AA				

FORM II**BLANK RESULTS**

Date: 04-Oct-16

Lab Name: TestAmerica Inc

Matrix: SOLID

SDG: 51987

Report No. : 69444

Parameter	Result	Count Error (2 s)	CSU (2 s)	MDL, Lc	Rpt Unit, CRDL	Yield	Rst/MDL, Rst/TotUncert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Primary Detector
PLUTONIUM-238	-3.97E-03	U	3.3E-02	7.68E-02	PCI_G	79%	-0.05	9/29/16 05:35 p	1.09	ALP427	
PLUTONIUM-239/240	1.19E-02	U	3.3E-02	1.93E-02	1.00E+00		-0.24		g	ALP427	
				7.89E-02	PCI_G	79%	0.15	9/29/16 05:35 p	1.09		
				2.04E-02	1.00E+00		0.71		g		
Batch: 6237033	L4SX		Work Order: M85VG1AA		Report DB ID: M85VG1AB						
AMERICIUM-241	8.15E-03	U	3.2E-02	8.34E-02	PCI_G	84%	0.1	9/30/16 06:01 p	1.09	ALP431	
				2.35E-02	1.00E+00		0.51		g		

No. of Results: 11 Comments:

FORM II

Date: 04-Oct-16

LCS RESULTS

Lab Name: TestAmerica Inc
Matrix: SOLID

SDG: 51987
Report No.: 69444

Parameter	Result	Qual	Count Error (2 s)	CSU (2 s)	MDL	Report Unit	Yield	Expected	Uncert	Recovery, Bias	Analysis, Prep Date	Aliquot Size	Primary Detector
Batch: 6237035	RL-LSC-008	4.4E-01	5.9E-01	Work Order: M85VJ1AC	4.79E-01	PCI_G	100%	7.28E+00	1.46E-01	107%	10/4/16 02:48 p	5.1	LSC9
CARBON-14	7.77E+00			Report DB ID: M85VJ1CS			Rec Limits:	75	125	0.1		g	
Batch: 6237032	C0SR			Work Order: M85VF1AC			Report DB ID: M85VF1CS						
URANIUM-233/234	3.05E+00			6.9E-01	5.88E-02	PCI_G	86%	3.24E+00	1.71E-02	94%	9/16/16 05:28 p	1.02	ALP430
URANIUM-238	2.89E+00			6.6E-01	5.88E-02	PCI_G	Rec Limits:	75	125	-0.1		g	
URANIUM-238	2.89E+00			6.6E-01	5.88E-02	PCI_G	86%	3.40E+00	1.79E-02	85%	9/16/16 05:28 p	1.02	ALP430
Batch: 6237036	E7XW			Work Order: M85VK2AC			Report DB ID: M85VK2CS						
NEPTUNIUM-237	1.24E+00		2.3E-01	4.1E-01	4.82E-02	PCI_G	87%	1.38E+00	6.35E-02	90%	9/19/16 11:44 p	1.35	ALP129
THORIUM-230	1.63E+00			3.7E-01	4.71E-02	PCI_G	Rec Limits:	75	125	-0.1		g	
Batch: 6237034	L4S1			Work Order: M85VH1AC			Report DB ID: M85VH1CS						
PLUTONIUM-239/240	3.48E+00			3.7E-01	4.71E-02	PCI_G	88%	1.61E+00	1.67E-02	101%	9/29/16 08:58 p	1.41	ALP27
Batch: 6237031	L4SO			Work Order: M85VD1AC			Report DB ID: M85VD1CS						
PLUTONIUM-239/240	3.48E+00			7.5E-01	5.28E-02	PCI_G	Rec Limits:	75	125	0.0		g	
Batch: 6237033	L4SX			Work Order: M85VG1AC			Report DB ID: M85VG1CS						
AMERICIUM-241	3.33E+00			7.4E-01	5.55E-02	PCI_G	84%	3.23E+00	3.79E-02	108%	9/29/16 05:38 p	1.41	ALP429
Batch: 6237033	L4SX			7.4E-01	5.55E-02	PCI_G	Rec Limits:	75	125	0.1		g	
No. of Results:	7	Comments:											

113715 Rider Trail North
Earth City, MO 63045
Phone (314) 298-8566 Fax (314) 298-8757

13715 Rider Trail North

Earth City, MO 63045
Phone (314) 298-8566 Fax (314) 298-8757

TestAmerica Laboratories, Inc.

testAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Sample Check-in List

Date/Time Received: 8-24-14 | 1015 Container GM Screen Result: (Airlock) O cpm Initials B]
 Sample GM Screen Result (Sample Receiving) O cpm Initials B]

Client: STLOR SDG #: 51987 SAF #: _____ NA []

Lot Number: J4H240415

Chain of Custody # 140-91913.1

Shipping Container ID or Air Bill Number: _____ NA []

Samples received inside shipping container/cooler/box Yes [] Continue with 1 through 4. Initial appropriate response.
 No [] Go to 5, add comment to #16.

1. Custody Seals on shipping container intact? Yes [] No [] No Custody Seal []
2. Custody Seals dated and signed? Yes [] No [] No Custody Seal []
3. Cooler temperature: _____ °C NA [] Wet [] Dry []
4. Vermiculite/packing materials is NA [] Wet [] Dry []

Item 5 through 16 for samples. Initial appropriate response.

5. Chain of Custody record present? Yes [] No []
6. Number of samples received (Each sample may contain multiple bottles): 6
7. Containers received: 6x 4 oz jar

8. Sample holding times exceeded? NA [] Yes [] No []
9. Samples have: tape hazard labels custody seals appropriate sample labels
10. Matrix: A (FLT, Wipe, Solid, Soil) I (Water) S (Air, Niosh 7400) T (Biological, Ni-63)

11. Samples: ✓ are in good condition are leaking are broken
 have air bubbles (Only for samples requiring no head space) Other _____
12. Sample pH appropriate for analysis requested Yes [] No [] NA []
 (If acidification is necessary go to pH area & document sample ID, initial pH, amount of HNO₃ added and pH after addition on table)
13. Were any anomalies identified in sample receipt? Yes [] No []
14. Description of anomalies (include sample numbers): NA [] _____

15. Sample Location, Sample Collector Listed on COC? * Yes [] No []
 *For documentation only. No corrective action needed.

16. Additional Information: N/A

Client/Courier denied temperature check.

Client/Courier unpack cooler.

Sample Check-in List completed by Sample Custodian:
 Signature: Juliie Boal

Date: 8-24-14

Client Notification needed? Yes [] No [] Date: _____
 By: _____
 Person contacted: _____

No action necessary; process as is

Project Manager John M. Boal

Date 8-24-16